

**EXAMINING EPA'S REGIONAL HAZE PROGRAM:
REGULATIONS WITHOUT VISIBLE BENEFITS**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTEENTH CONGRESS

SECOND SESSION

March 23, 2016

Serial No. 114-71

Printed for the use of the Committee on Science, Space, and Technology



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**EXAMINING EPA'S REGIONAL
HAZE PROGRAM:
A TEN-YEAR REVIEW OF COSTS
AND BENEFITS**

WEDNESDAY, MARCH 23, 2016

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT AND
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to call, at 9:33 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Jim Bridenstine [Chairman of the Subcommittee] presiding.

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

Congress of the United States
House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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Subcommittee on Environment

***Examining EPA's Regional Haze Program: Regulations
Without Visible Benefits***

Wednesday, March 23, 2016
9:30 a.m. – 11:30 a.m.
2318 Rayburn House Office Building

Witnesses

Mr. William Yeatman, Senior Fellow, Competitive Enterprise Institute

Mr. Thomas P. Schroedter, Executive Director and General Counsel, Oklahoma Industrial Energy Consumers

Mr. Bruce Polkowsky, Environmental Policy Consultant

Mr. Aaron M. Flynn, Partner, Hunton & Williams

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON ENVIRONMENT**

HEARING CHARTER

Examining EPA's Regional Haze Program: Regulations Without Visible Benefits

Wednesday, March 23, 2016
9:30 a.m. – 11:30 a.m.
2318 Rayburn House Office Building

PURPOSE

The Environment Subcommittee will hold a hearing entitled *Examining EPA's Regional Haze Program: Regulations Without Visible Benefits* on Wednesday, March 23, 2016, at 9:30 a.m. in Room 2318 of the Rayburn House Office Building. The purpose of the hearing is to examine the Environmental Protection Agency's (EPA) Regional Haze Program, including its scientific underpinnings. Witnesses will discuss the impact and costs of these regulations on various stakeholders, including individual states.

WITNESSES

- **Mr. William Yeatman**, Senior Fellow, Competitive Enterprise Institute
- **Mr. Thomas P. Schroedter**, Executive Director and General Counsel, Oklahoma Industrial Energy Consumers
- **Mr. Bruce Polkowsky**, Environmental Policy Consultant
- **Mr. Aaron M. Flynn**, Partner, Hunton & Williams

BACKGROUND

The Regional Haze Rule, found in sections 169A and 169B of the Clean Air Act, call for state and federal agencies to work together to improve visibility in 156 national parks and wilderness areas, including the Grand Canyon and Yosemite. The rule requires individual states, in coordination with EPA, the National Park Service, U.S. Fish and Wildlife Service, the U.S. Forest Service, and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment.

The rule calls for states to use Best Available Retrofit Technology (BART) on existing sources of emissions impairing visibility.¹ Through State Implementation Plans (SIPs), BART requires certain industrial facilities emitting pollution to implement measures to reduce emissions of pollutants contributing to regional haze. The Clean Air Act requires that BART should "take into

¹ <https://www.gpo.gov/fdsys/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapl-partC-subpartii-sec7491.htm>

consideration the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.”²

Congress intended the Regional Haze Rule to be a state-led initiative since it is an aesthetic regulation. In addition, the intent of the Regional Haze Rule was to encourage and promote state and federal agencies to work together to improve visibility inside national parks and wilderness areas. However, EPA has recently imposed 14 Regional Haze Federal Implementation Plans (FIPs). Currently, two additional FIPs are being finalized. The cost of the 14 Regional Haze FIPs are almost three times the combined sum of all Clean Air Act FIPs imposed by the previous three administrations, which imposed only five total Clean Air Act takeovers. The Obama Administration has imposed 54 Clean Air takeovers of state programs (14 of which are Regional Haze) since 2009.³

EPA rejected Texas’s Regional Haze SIP and recently imposed a Regional Haze FIP on the state. On March 18 2016, Texas Attorney General Ken Paxton requested a stay of this Texas FIP in the U.S. Court of Appeals for the Fifth Circuit. The stay would prevent the U.S. Environmental Protection Agency (EPA) from imposing its FIP until it is decided in the courts.⁴ Texas plans on challenging this mandate in the U.S. Court of Appeals for the Fifth Circuit.⁵ EPA’s Texas FIP would affect 14 power plants and cost more than \$2 billion.⁶ EPA rejected Arkansas’s Regional Haze compliance plan and now is trying to stage a regulatory takeover that would cost ratepayers in the state slightly more than \$200 million annually for the next 30 years.⁷ In Oklahoma, the utility company OG&E Energy Corporation expects to spend more than \$500 million on two scrubbers in order to comply with regional haze regulations.⁸

² <https://www.gpo.gov/fdsys/pkg/USCODE-2013-title42/html/USCODE-2013-title42-chap85-subchapl-partC-subpartII-sec7491.htm>

³ <http://www.globalwarming.org/2015/12/09/epa-imposes-54th-clean-air-act-federal-takeover-of-a-state-program-previous-3-presidents-imposed-5-total-among-them/>

⁴ https://www.texasattorneygeneral.gov/files/epress/files/2016/regional_haze.pdf

⁵ <http://www.texaslawyer.com/id=1202751167112/Texas-Requests-5th-Circuit-Examination-of-Environmental-Protection-Agency-Regional-Haze-Plan?slreturn=20160217170220>

⁶ <http://www.regulations.gov/#!documentDetail;D=EPA-R06-OAR-2014-0754-0008>

⁷ FIP <https://www.gpo.gov/fdsys/pkg/FR-2015-04-08/pdf/2015-06726.pdf>

⁸ <http://newsok.com/article/5478494>

Chairman BRIDENSTINE. All right. The Subcommittee on the Environment will come to order.

Without objection, the Chair is authorized to declare recesses of the Committee at any time.

Welcome to today's hearing titled "Examining the EPA's Regional Haze Program: Regulations Without Visible Benefits." I recognize myself for five minutes for an opening statement.

Today's hearing focuses on EPA's Regional Haze Rule. As the Obama Administration nears the end of its time in office, we must carefully review the impact, costs, and achievability of any rules and implementation plans this activist EPA attempts to put in place on the way out the door. As we will see, the benefits of this regulation are dubious but the costs to individual states, including my home state of Oklahoma, will be very, very high.

Unlike the other regulations promulgated under the Clean Air Act that this Committee has examined, the Regional Haze Rule is unique for two important reasons. First, it is an aesthetic regulation, and not a public health regulation. These rules were designed primarily to ensure the public can clearly see the sights at National Parks and other natural landmarks. Second, Clean Air Act legislative history specifically gives individual states a unique degree of authority to be decision makers when implementing visibility-improving policies. Over the past several decades, visibility levels at many of our national parks and wilderness areas have significantly improved, due in large part to the efforts of individual states working together with stakeholders to implement plans at the state level. The EPA did not object to the state plans then, recognizing our system of federalism.

But under this President, the EPA has overruled the plans created by many states to comply with this rule, instituting Federal Implementation Plans in 14, including Oklahoma, 14 states, and attempting to institute Federal Implementation Plans in two more. These federal plans will have huge implementation costs, hurting consumers, those on fixed incomes, and small businesses. It will force coal-fired power plants to shut down and make electricity generation more expensive. OG&E and AEP-PSO, utilities in my state, have had to shut down power plants, forcing them to propose rate hikes or else go out of business.

I will remind my colleagues about the multitude of economically detrimental, radical regulations pushed by this administration, including the Clean Power Plan, Waters of the United States, and the National Ambient Air Quality Standards for ozone. And now, in a continuation of its war on the poor, the EPA is using "visibility improvement" to force utilities and other stakeholders to further move away from coal and other forms of cost-effective power generation. What's worse is that the improvements to visibility will be negligible. Many of the EPA's own visibility goals have already been achieved.

Further, the scientific justification for this regulation is shaky and questionable, as our witnesses will testify. The EPA is instituting more stringent controls for visibility than it would for health-based regulations. The precedents set in this rule—requiring additional controls with no real benefit while requiring controls on individual generation sources—could have significant and draco-

nian ramifications for regional haze planning across the country. This is yet another example of the federal government bullying my constituents.

Later this spring, the Committee will invite the EPA so that it will answer questions as to why it has become a radical political arm of the Obama Administration, and why they are rushing through a vast number of hasty, non-scientific regulations, including the Regional Haze Implementation Plans. The EPA needs to be held accountable to the American people.

We welcome the witnesses today and look forward to their testimony.

[The prepared statement of Chairman Bridenstine follows:]



COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
 Lamar Smith, Chairman

For Immediate Release
 March 23, 2016

Media Contact: Zachary Kurz
 (202) 225-6371

Statement of Environment Subcommittee Chairman Jim Bridenstine (R-Okla.)
Examining EPA's Regional Haze Program: Regulations Without Visible Benefits

Chairman Bridenstine: I recognize myself for five minutes for an opening statement. Today's hearing focuses on EPA's Regional Haze rule. As the Obama Administration nears the end of its time in office, we must carefully review the impact, costs, and achievability of any rules and implementation plans this activist EPA attempts to put in place on the way out the door. As we will see, the benefits of this regulation are dubious but the costs to individual states, including my home state of Oklahoma, will be very high.

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These federal plans will have huge implementation costs, hurting consumers, those on fixed incomes, and small businesses. It will force coal-fired power plants to shut down and make electricity generation more expensive. OG&E and AEP-PSO, utilities in my state, have had to shut down power plants, forcing them to propose rate hikes or else go out of business.

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We welcome the witnesses today and look forward to their testimony.

###

Chairman BRIDENSTINE. I now recognize the Ranking Member, the gentlewoman from Oregon, for an opening statement.

Ms. BONAMICI. Thank you very much, Mr. Chairman. Thank you to our witnesses for being here this morning.

On August 25th of this year the National Park Service will celebrate their centennial. So it's fitting that we're discussing EPA's efforts to reduce regional haze and maintain the scenic outlook of our most treasured locations.

President John F. Kennedy said of the creation of the National Park System: "It is the course of wisdom to set aside an ample portion of our natural resources as national parks and reserves, thus ensuring that future generations may know the majesty of the earth as we know it today."

In 1977, Congress had the foresight to take President Kennedy's sentiment to heart and they recognized the threat that air pollution posed to our iconic parks and they called on EPA to reduce regional haze.

Some may think that preserving the views in our parks and wilderness areas isn't worth the cost, but clearer skies actually have a direct effect on the economy, especially in the local communities that surround our National Parks. Studies have consistently shown that park visitors will cut their trip short if the park they are planning to visit is hazy. Shorter trips and fewer visitors means less money spent on recreational activities, lodging, and food. For example, in 2014, more than half a million visitors traveled to Oregon's Crater Lake, supporting more than 760 jobs.

As a whole our National Park System had 293 million visitors who added \$29.7 billion to the U.S. economy and supported 277,000 jobs. We should be doing more, not less, to protect these iconic landscapes and the local economies they support.

I'd like to put up a slide that shows the progress we've made under the regional haze program, and emphasize that there are visible benefits but still work to be done.

[Slide.]

This slide shows a side-by-side comparison of the Great Smoky Mountains, illustrating the air pollution that existed in 1990, the clearing that occurred in 2010, and the goal of natural visibility that still needs to be achieved. In 1990, a park visitor could see 25 miles out, in 2010, 46 miles, and with natural visibility conditions they can see 112 miles of this magnificent mountain range.

Now, I know some consider EPA's efforts to improve air quality under the Clean Air Act, including the Regional Haze rule, to be a war on coal. I want to mention that earlier this month, Oregon became—my home State of Oregon—became the first state to enact bipartisan legislation to eliminate the use of coal-fired power by 2035. We did this because coal-fired power plants are some of our biggest polluters, and if we are going to make significant progress in combating air pollution in the future, we need to transition to cleaner sources of energy now. Such a transition will provide economic opportunities, improve public health, and preserve the majesty of our National Parks for future generations.

Mr. Chairman, I have a letter from the National Parks Conservation Association that I'd like to submit for the record. The letter describes the importance of clean air to our National Parks and the

need for the Regional Haze program. Specifically, the letter states "A steady reduction in haze-causing pollution is precisely what is required under the Regional Haze Rule to safeguard our iconic landscapes, support local communities, and protect the health of all." I ask unanimous consent that the letter be part of the record.

Chairman BRIDENSTINE. Without objection.

[The information appears in Appendix II]

Ms. BONAMICI. Thank you, Mr. Chairman.

I look forward to the testimony of our witnesses, and at this time, Mr. Chairman, I yield back the balance of my time.

[The prepared statement of Ms. Bonamici follows:]

OPENING STATEMENT

Ranking Member Suzanne Bonamici (D-OR)

House Committee on Science, Space, and Technology
Subcommittee on Environment

“Examining EPA’s Regional Haze Program: Regulations Without Visible Benefits”
March 23, 2016

Thank you, Mr. Chairman and thank you to our witnesses for being here this morning. On August 25th of this year the National Parks Service will celebrate their centennial. So it is fitting that we are discussing EPA’s efforts to reduce regional haze and maintain the scenic outlook of our most treasured locations.

President John F. Kennedy said of the creation of the National Park System: “It is the course of wisdom to set aside an ample portion of our natural resources as national parks and reserves, thus ensuring that future generations may know the majesty of the earth as we know it today.”

In 1977, Congress had the foresight to take President Kennedy’s sentiment to heart. And they recognized the threat air pollution posed to our iconic parks and called on EPA to reduce regional haze.

Some may think that preserving the views in our parks and wilderness areas isn’t worth the cost, but clearer skies actually have a direct effect on the economy, especially in the local communities that surround our National Parks.

Studies have consistently shown that park visitors will cut their trip short if the park they are planning to visit is hazy. Shorter trips and fewer visitors means less money spent on recreational activities, lodging, and food. In 2014, more than half a million visitors traveled to Oregon’s Crater Lake, supporting more than 760 jobs. As a whole our National Parks System had 293 million visitors who added \$29.7 billion to the U.S. economy and supported 277,000 jobs. We should be doing more, not less, to protect these iconic landscapes and the local economies they support.

I'd like to put up a slide that shows the progress we've made under the regional haze program, and emphasize that there are visible benefits but still work to be done.

This slide shows a side-by-side comparison of the Great Smokey Mountains, illustrating the air pollution that existed in 1990, the clearing that occurred in 2010, and the goal of natural visibility that still needs to be achieved. In 1990 a park visitor could only see 25 miles out, in 2010 they could see 46 miles, and when we get to natural visibility conditions they will be able to see 112 miles of this magnificent mountain range.

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Thank you, Mr. Chairman.

Thank you, Mr. Chairman and I yield back the balance of my time.

Chairman BRIDENSTINE. Thank you, Ms. Bonamici.

I now recognize the chairman of the full Committee, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chairman, and thanks to our witnesses for being here today as well.

The Science Committee has held many hearings on the regulatory overreach of the Environmental Protection Agency during this administration. Unfortunately, the EPA is again attempting to unnecessarily and unlawfully regulate the lives of the American people. Throughout this Congress, the Committee has often revealed how the EPA's regulatory overreach will cost billions of dollars, cause financial hardship for American families, and diminish the competitiveness of American employers, all with no significant benefit to climate change, public health, or the economy. The EPA has rushed through many costly and burdensome regulations. Examples include the strict new National Ambient Air Quality Standards for ozone, Waters of the U.S., and the Clean Power Plan.

Today we will hear how the EPA's interpretation and execution of the regional haze rule unlawfully undercuts the statutory authority of the individual states. Congress clearly intended, through the Clean Air Act, that individual states be responsible and in charge of the program, not the federal government. Instead, the administration is determined to use this rule to impose more costly regulations on Americans.

In my home state of Texas, the EPA's regional haze imposition would affect 14 power plans and cost more than two billion dollars. This past Friday, the Attorney General for Texas requested a stay of this plan.

EPA's regulatory agenda is bad for the American economy and for the American people. We cannot allow a federal agency to assume power that Congress has not given it. The Science Committee will continue to rein in the EPA when it oversteps its authority. Contrary to the EPA's agenda, Americans want to be free from overly burdensome regulations, not tied up in more.

We look forward to EPA's presence at a future hearing. EPA will also be expected to answer questions about other regulations that the agency has recently issued or finalized.

Thank you again, Mr. Chairman, and yield back.

[The prepared statement of Chairman Smith follows:]



COMMITTEE ON
SCIENCE, SPACE, & TECHNOLOGY
Lamar Smith, Chairman

For Immediate Release
March 23, 2016

Media Contact: Zachary Kurz
(202) 225-6371

Statement of Chairman Lamar Smith (R-Texas)

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We look forward to EPA's presence at a future hearing. EPA will also be expected to answer questions about other regulations that the agency has recently issued or finalized.

Thank you again Mr. Chairman and yield back.

###

Chairman BRIDENSTINE. I'd like to thank the Chairman for his opening statement.

I now recognize the Ranking Member of the full Committee for an opening statement.

Ms. JOHNSON. Thank you very much, Mr. Chairman. Welcome to our witnesses.

We are here this morning to discuss the Environmental Protection Agency's Regional Haze program. Nearly 40 years ago, Congress called on EPA to implement a program that would address air pollution in the most iconic and unique places in our country: our National Parks. Members of Congress wanted to ensure that future generations would be able to enjoy these scenic vistas and that their view would not be marred by a discolored haze. While the Nation's air quality has improved over the years, in part because of programs like the one we are discussing today, there is still more that needs to be done.

When someone visits a National Park today they miss out on nearly 50 miles of scenery because of regional haze. This pollution doesn't just spoil the view; it also has a negative impact on public health.

Unfortunately, officials from my home State of Texas are not leading the charge to reduce air pollution, but instead are fighting the EPA once again. Last month, Texas Attorney General Ken Paxton filed a lawsuit against EPA after the Agency rejected the state's plan for reducing regional haze and replaced it with a federal plan. As I understand it, the Texas plan did not include a single additional pollution control on any of the state's facilities. I'm not sure how the state expected EPA to agree that such a do-nothing plan could qualify as making reasonable progress toward the program's goal of eliminating haze pollution and restoring natural visibility conditions.

Some will likely argue that the pollution controls EPA is requiring will not have significant impact on visibility at the Big Bend or the Guadalupe Mountains. They will also argue that the controls are too expensive and that the reliability of states' electric grid will be threatened. This certainly is not the case. EPA's plan represents a cost-effective solution to addressing regional haze. The EPA's plan will not only ensure that visitors to the Big Bend and the Guadalupe Mountains can enjoy the scenery for years to come, but it will help lessen the public health burden poor air quality has imposed on Texas for far too long.

So Mr. Chairman, I thank you for holding this hearing, and I yield back the balance of my time.

[The prepared statement of Ms. Johnson follows:]

OPENING STATEMENT

Ranking Member Eddie Bernice Johnson (D-TX)

House Committee on Science, Space, and Technology
Subcommittee on Environment

“Examining EPA’s Regional Haze Program: Regulations Without Visible Benefits”
March 23, 2016

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While the nation’s air quality has improved over the years – in part because of programs like the one we are discussing today – there is still more that needs to be done. When someone visits a National Park today they miss out on nearly 50 miles of scenery because of regional haze. This pollution doesn’t just spoil the view; it also has a negative impact on public health.

Unfortunately, officials from my home State of Texas, are not leading the charge to reduce air pollution, but instead are fighting the EPA once again. Last month, Texas Attorney General Ken Paxton filed a lawsuit against EPA after the agency rejected the state’s plan for reducing regional haze and replaced it with a federal plan.

As I understand it, the Texas plan did not include a single additional pollution control on any of the state’s facilities. I’m not sure how the state expected EPA to agree that such a do-nothing plan could qualify as making reasonable progress toward the program’s goal of eliminating haze pollution and restoring natural visibility conditions.

Some will likely argue that the pollution controls EPA is requiring will not have significant impact on visibility at Big Bend or the Guadalupe Mountains. They will also argue that the controls are too expensive and that the reliability of state’s electric grid will be threatened. This is not the case. EPA’s plan represents a cost-effective solution to addressing regional haze.

The EPA’s plan will not only ensure that visitors to Big Bend and the Guadalupe Mountains can enjoy the scenery for years to come, but it will help lessen the public health burden poor air quality has imposed on Texans for far too long.

Thank you, Mr. Chairman and I yield back the balance of my time.

Chairman BRIDENSTINE. I thank the Ranking Member.

I have a number of pages here of bios to read. We have votes at 10:30, so without objection, I'll bypass on the bios, and suffice it to say that we have four very qualified panelists today testifying. All of them have numerous degrees, and they all care deeply about their communities and their country.

With that said, I'd like to now—

Ms. BONAMICI. No objection.

Chairman BRIDENSTINE. No objection. With that said, I'd like to now recognize Mr. Yeatman for his opening statement of five minutes.

**TESTIMONY OF MR. WILLIAM YEATMAN
SENIOR FELLOW,
COMPETITIVE ENTERPRISE INSTITUTE**

Mr. YEATMAN. Thank you. Chairman Bridenstine, Ranking Member Bonamici, Committee Ranking Member Johnson, and distinguished members of the Subcommittee, thank you very much for inviting me to testify before you on EPA's implementation of the Regional Haze program.

My name is William Yeatman. Very briefly, I work at the Competitive Enterprise Institute. We're a libertarian think tank here in Washington, DC. With my testimony I just want to briefly touch upon two themes as they relate to the Regional Haze Rule, and that's federalism and cost as against benefits.

So first, under the Clean Air Act's framework of cooperative federalism, states and EPA are supposed to work together to improve the Nation's air quality. Now, in this arrangement, the most aggressive action that EPA can perform relative to the states is a regulatory takeover. It's known as a Federal Implementation Plan, and these—or FIP. And these FIPs are a big deal. They literally are EPA seizing a small piece of state sovereignty. Because these FIPs, these regulatory takeovers, are a big deal, they've been employed sparingly, very sparingly, by previous Administrations. For example, the previous three Administrations, Presidential Administrations—George H.W. Bush, Bill Clinton, and George W. Bush—among them EPA imposed five total regulatory takeovers across all Clean Air Act programs. Now, by contrast, since 2009, EPA has imposed 15 FIPs, and that's just in the Regional Haze program, so you take the previous three Administrations, their total number of takeovers across the entire Clean Air Act, you add them up, you multiply them times three, and that's how many we've had from the Environmental Protection Agency since 2009.

So this raises significant federalism implications. At the same time, it raises cost concerns by my estimate. These regulatory takeovers will amount to cost of at least \$5 billion. That's in capital cost up front. This burden will fall primarily upon about seven states including Oklahoma, which again the residents of Tulsa and Oklahoma City are facing rate increases of 14 and 20 percent, respectively, and that's just the beginning and it's due to the Regional Haze Rule. Again, these costs fall disproportionately on the poorest amongst us. They're aggressive. The poorest among us spend more on energy as a proportion of their income. So we've got these federalism concerns, we've got these aggressive costs. You might think

to yourself, well, geez, EPA must have a really good reason to do this, to perform these acts, and in fact, the case is—alas, that's not the case. I mean, the benefits are literally invisible, and we can demonstrate this with computer modeling known as—or software, I should say, known as WinHaze, we can model the visibility improvements attendant to EPA's controls relative to the states' controls, and if we could please get the first, so this is a split-screen image. On the left, those are the state controls. They're 50 percent of the screen. That's what Oklahoma did, you know, thousands of hours of work they put into a plan, more than a thousand pages. Those are the visibility benefits. So on the right, those are the visibility benefits attendant to EPA's controls, and again, those are invisible. No reasonable person is going to tell you there's a difference there. Again, the cost is \$1.8 billion. So big-time cost, invisible benefits. I should note that this is the greatest visibility improvement wrought by any of EPA's FIPs, so this is—there's no state whose, you know, benefit, if you will, is greater than this.

If we could get the next slide?

[Slide.]

This is Texas, so similarly, this is actually a visibility benefit one-sixth of the previous slide, of Texas, the implementation plan on the left, EPA's on the right. EPA deemed Texas's plan insufficiently protective of visibility, and based on that imposed this plan for \$1.7 billion. I mean, there's no difference. It raises serious questions about, I guess, again, cost versus benefit. So those were the themes I wanted to brush upon just in general.

This plan raises serious federalism concerns. It imposes regressive significant costs, and the benefits are literally invisible.

Thank you very much. I look forward to the Q&A.

[The prepared statement of Mr. Yeatman follows:]

Testimony of William Yeatman
Senior Fellow, Competitive Enterprise Institute
on
“EPA’s Regional Haze Program”
before the
Subcommittee on Environment
Committee on Science, Space, & Technology
March 23, 2016

Chairman Jim Bridenstine, Ranking Member Bonamici, Members of the Subcommittee, thank you for inviting me to testify before you today about the Environmental Protection Agency’s Regional Haze program. My name is William Yeatman, and I’m a Senior Fellow at the Competitive Enterprise Institute. We are a non-profit public policy organization dedicated to advancing the principles of limited government, free enterprise, and individual liberty. CEI specializes in regulatory policy. We accept no government funding and rely entirely on individuals, corporations, and charitable foundations for our financial support.

1. As Administered since 2009, the Regional Haze Regime Has Been an Affront to Clean Air Act Cooperative Federalism

The 95th Congress that created the Regional Haze program nearly forty years ago (as part of the 1977 Clean Air Act amendments) would not recognize the ‘federal-first’ rule that has been implemented by the EPA during the administration of President Barack Obama. When it drafted the Regional Haze provision, Congress’s clear intent was for the States to be in charge of the program, due to its being an aesthetic regulation, rather than a public health one. In floor debate in 1977, Congress unequivocally said that states would have the authority to decide how much value to assign to an aesthetic benefit, and the resulting language of the Clean Air Act reflects this fact.

Since 2009, however, the EPA has run roughshod over the States rightful authority under the Regional Haze rule. In fact, EPA has rejected 15 state plans for Regional Haze and imposed in their stead federal implementation plans (FIPs) costing at least \$5 billion. Under the Clean Air Act’s cooperative federalism structure, a FIP is the most drastic and aggressive action the EPA can take against a state government. In practice, a FIP represents a seizure of the state’s authority. Simply put, Clean Air Act FIPs are a big deal. For comparison’s sake, consider that the previous three presidential administrations (*i.e.*, George H.W. Bush, Bill Clinton, and George W. Bush) together imposed five total Clean Air Act FIPs. Obama’s EPA, in contrast, has imposed 54 total Clean Air Act FIPs, of which, again, fifteen pertain to Regional Haze.

For more, see:

- William Yeatman, “How the EPA Is Undermining Cooperative Federalism under the Clean Air Act,” Competitive Enterprise Institute, On Point No. 197 (2014) link: <http://cei.org/sites/default/files/William%20Yeatman%20How%20the%20EPA%20Is%20Undermining%20Cooperative%20Federalism.pdf>
- William Yeatman, “EPA’s Regional Haze Regime Imposes Big Costs for Invisible Benefits,” Written Testimony before the House Subcommittee on Technology, Information Policy,

Intergovernmental Relations and Procurement Reform, June 28, 2012, link:
<https://cei.org/news-releases/epas-regional-haze-regime-imposes-big-costs-invisible-benefits>

2. Regional Haze Costs Are Wholly Incommensurate with Its Invisible “Benefits”

EPA uses a metric known as a “deciview” to measure visibility improvement. A deciview value of 0 represents the clearest possible visibility, *i.e.*, the view is unaffected by haze. As the deciview number increases, visibility becomes progressively poorer. According to peer-reviewed research, it would require an improvement of five to ten deciviews in order for the average person to perceive the difference in visibility with certainty, depending on conditions. With this referent in mind, consider the fact that in December of 2015, the EPA imposed a federal plan on Texas that would entail almost \$2 billion in compliance costs in order to achieve a maximum visibility benefit of about .5 deciviews. Peer-reviewed science tells us there is a mere ten percent probability that the average person would detect this difference, which is the justification for nearly \$2 billion in compliance costs.

Thanks to computer software, we can model the visibility “benefit” of EPA’s Regional Haze FIPs over the State plans, and thereby compare the visibility improvements associated with the state and federal plans. For example, the largest deciview improvement achieved by any of EPA’s fifteen Regional Haze takeovers (relative to the state plans) occurred in Oklahoma. There, the agency imposed a FIP that amounted to a 2.89 deciview improvement over the Oklahoma plan, at a cost of almost \$1.8 billion. For my oral testimony, I hope to depict side-by-side images comparing the difference in visibility between the EPA plan and the Oklahoma plan to Members present. Otherwise the images are [available online](#). Indeed, the images are indistinguishable! That is, the difference between the two plans is literally invisible. And, as noted above, the Oklahoma federal takeover represents the greatest degree of visibility improvement of any of the federal plans. Every other federal plan amounts to less than a two deciview “improvement.”

While the benefits of EPA’s Regional Haze takeovers are demonstrably non-existent, the costs are all too real. In Oklahoma, ratepayers are on the hook for \$1.8 billion. In Texas, the capital costs are almost \$2 billion. In New Mexico, costs exceed \$700 million. In Wyoming, ratepayers face about \$650 million in capital costs. EPA is soon to finalize a FIP in Arkansas that threatens to impose almost \$275 million in upfront expenses. Of course, the regulatory burden will fall heaviest on the poorest, for whom energy costs occupy a higher share of their personal (often fixed) income. Crucially, none of these costs will bring about a perceptible change in visibility. The “benefit” to ratepayers is nothing.

For more, see:

- William Yeatman, “EPA’s New Regulatory Front: Regional Haze and the Takeover of State Programs,” U.S. Chamber of Commerce (2012), link:
https://www.uschamber.com/sites/default/files/legacy/reports/1207_ETRA_HazeReport_Ir.pdf
- Ronald C. Henry, “Estimating the Probability of the Public Perceiving a Decrease in Atmospheric Haze,” *Journal of the Air & Waste Management Association*, 55(11), 1164 figure 3 (2005)

3. The Unfortunate Role of “Sue and Settle” Litigation in EPA’s Regional Haze Regime

It is no exaggeration that every EPA disapproval of a state Regional Haze submission and every EPA regulatory takeover of a state Regional Haze program has occurred pursuant to a “sue and settle” lawsuit with environmental special interests.

Beginning in 2009, a group of nonprofit environmental advocacy organizations—Sierra Club, WildEarth Guardians, Environmental Defense Fund, National Parks Conservation Association, Montana Environmental Information Center, Grand Canyon Trust, San Juan Citizens Alliance, Our Children’s Earth Foundation, Plains Justice, and Powder River Basin Resource Council—filed lawsuits against EPA alleging that the agency had failed to perform its nondiscretionary duty to act on state submissions for regional haze. Rather than defend these cases, EPA simply chose to settle. In five Consent Decrees negotiated with environmental groups and, importantly, without notice to the states that would be affected—EPA agreed to commit itself to various deadlines to act on all states’ visibility improvement plans.

States are frequently caught off guard by these sue-and-settle agreements, because the EPA doesn’t inform them about the ongoing settlement negotiations. For example, the Florida Department of Environmental Protection’s Brian Accardo told a U.S. House of Representatives Committee that he only found out about a citizen suit settlement affecting his state’s regional haze planning when a notice appeared in the Federal Register—despite years of haze-related planning efforts. He said, “I was drinking my coffee and reading the Register and I became aware.”

In blatant contravention of the principles of cooperative federalism, the EPA and green groups have gone so far as to exclude States from negotiations resulting from these lawsuits, and, in at least one instance, EPA teamed up with green groups to litigate to keep a State from intervening. When North Dakota Attorney General Wayne Stenehjem learned that his state was subject to FIP pursuant to an EPA settlement with WildEarth Guardians in an Oakland federal court, he tried to gain intervention into the lawsuit, so that North Dakota could have a voice. The EPA opposed Stenehjem’s motion to intervene, and won a court order that kept North Dakota out of negotiations.

And because States are not afforded a voice in these “sue and settle” discussion, EPA and special interests are free to impose unreasonable deadlines on the regulatory process. Rushed rules, in turn, deprive States of meaningful input. For example, Arkansas Attorney General Leslie Rutledge recently commented to the EPA regarding the too-fast pace of the agency’s Regional Haze rulemaking in Arkansas resulting from a sue and settle deadline. According to AG Rutledge, “I do not believe that five months is an adequate time period for the EPA to fully analyze and respond to the public comments ... a rushed process that fails to fully review all considerations will lead to an arbitrary and capricious decision.”

For more, see:

- William Yeatman, *The U.S. Environmental Protection Agency’s Assault on State Sovereignty*, American Legislative Exchange Council (2013), link: <https://cei.org/studies/us-environmental-protection-agencys-assault-state-sovereignty>
- William Yeatman, “Al ‘Crucify’ Armendariz Emails Indicate Collusive ‘Sue & Settle’ Shenanigans on Regional Haze,” *GlobalWarming*, 20 June 2014, link:

<http://www.globalwarming.org/2014/06/20/primary-document-dump-fridays-al-crucify-armendariz-emails-indicate-collusive-sue-settle-shenanigans/>

4. Using “Independent” Contractors To Usurp State Decisions

Among the most disconcerting elements of the EPA’s Regional Haze regime has been the manner in which the agency has gone about disapproving state plans. In second-guessing state decisions on Regional Haze, the agency has relied on the same “independent” contractor as have the green special interests behind the “sue and settle” lawsuits. In this fashion, the EPA’s approach seems to raise serious conflict of interest issues.

States spend considerable resources putting together Regional Haze implementation plans, which routinely exceed a thousand pages. In order to disapprove a state implementation plan, the agency needs a reason to object. And in at least five States—New Mexico, Oklahoma, Nebraska, North Dakota, and Texas—the EPA has employed a supposedly independent consultant, Dr. Phyllis Fox, to second-guess state determinations regarding the cost of controls. In large part on the basis of Dr. Fox’s input, the agency has rejected these state plans and imposed federal plans that cost billions of dollars more.

There is substantial cause to doubt Dr. Fox’s “independence” as a consultant. For starters, she routinely serves as a witness for the very same environmental groups who sued to obtain the Regional Haze consent decrees. More to the point, she worked for these same groups on the Regional Haze regulation during the Obama administration—the same period she has been employed by the EPA to work on Regional Haze. For example, only months before she was hired by EPA to review Oklahoma’s Regional Haze plan, Dr. Fox was employed by the Sierra Club as a consultant in the group’s pursuit of stringent Regional Haze controls at the Four Corners Power Plant within the Navajo Nation reservation. And in 2012, Dr. Fox was employed by the Sierra Club as a consultant to help the group achieve costly Regional Haze controls in Montana.

The Sierra Club subsequently has relied on Dr. Fox’s prior work (from the rulemaking for the Montana Regional Haze FIP) to press for tighter emissions limits for the EPA’s federal implementation plan in Arkansas and Texas. At the same time, the EPA itself hired Dr. Fox to review the Texas Regional Haze submission. This means that Dr. Fox’s services were effectively employed by both the Sierra Club and the EPA in the same rulemaking to impose a Regional Haze FIP on Texas. The Sierra Club, of course, is one of the green litigation groups whose “sue and settle” suit (see D.D.C. No. 1:11-cv-01548) led to the Texas FIP to begin with. Thus, the EPA and Sierra Club are supposed adversaries over implementation of the Regional Haze before the judicial system, yet they both use the services of Dr. Fox in the regulatory process. The extent of these conflicted relationships appears to belie this contractor’s “independence.”

5. What Should Be Done?

The Regional Haze program, as it has been implemented over the last seven years, is broken. Congress intended for States to be in charge. Yet EPA has usurped the State’s rightful role through a number of seemingly dubious administrative means, including “sue and settle” litigation and also the employment of the environmental special interests’ go-to Regional Haze consultant to second guess state decisions. Congress should seek to restore the proper balance between States and the EPA under the cooperative

federalism framework established by the Regional Haze provision. To this end, I recommend that Congress should undertake two policies:

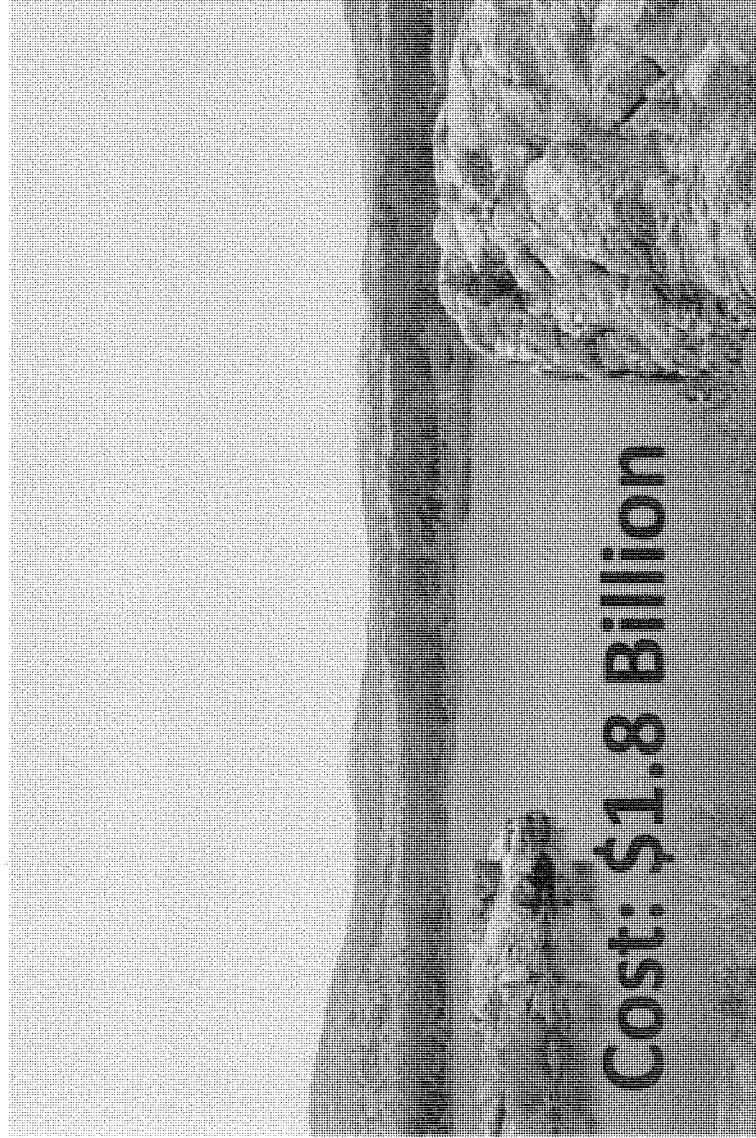
First, the Congress should pass a law stipulating that States, and not the EPA, are the primary decision-makers under the Regional Haze program, and, as such, Article III Courts should defer to States rather than the agency on all factual determinations made pursuant to the Regional Haze program. To date, the U.S. Courts of Appeals have upheld the agency's use of a hired consultant to second guess of state determinations regarding the costs and visibility improvements of Regional Haze controls. In so doing, the courts have reasoned that they must defer to EPA factual determinations. However, the courts' justification fails to hold water; EPA does not merit deference in implementing the Regional Haze program. In fact, Congress delegated to the States the primary authority to implement the Regional Haze program. In the execution of this delegation, the States invest significant resources into crafting highly complex implementation plans. From a practical standpoint, it makes no sense for States to do all the work of drafting a Regional Haze plan in the execution of a congressional delegation of authority, yet for courts to defer to a review of that plan conducted by a single consultant of arguable independent who was employed by the agency on an *ad hoc* basis. Congress would remedy this nonsensical situation by expressly affording States judicial deference for factual determinations rendered in the course of implementing the Regional Haze rule.

Second, the Congress should afford States intervention of right whenever a State seeks to participate in a sue and settle lawsuit. As I noted above, EPA has actually litigated to prevent States from joining these suits, which is an outrageous affront to the Clean Air Act's design of cooperative federalism. EPA's opposition to state participation in sue and settle negotiations flies in the face of reason, given that States are the regulated entities. Congress should ensure States are never again shut out of litigation pertinent to their own interests by the EPA, which is supposed to be an equal partner in implementing the Clean Air Act.

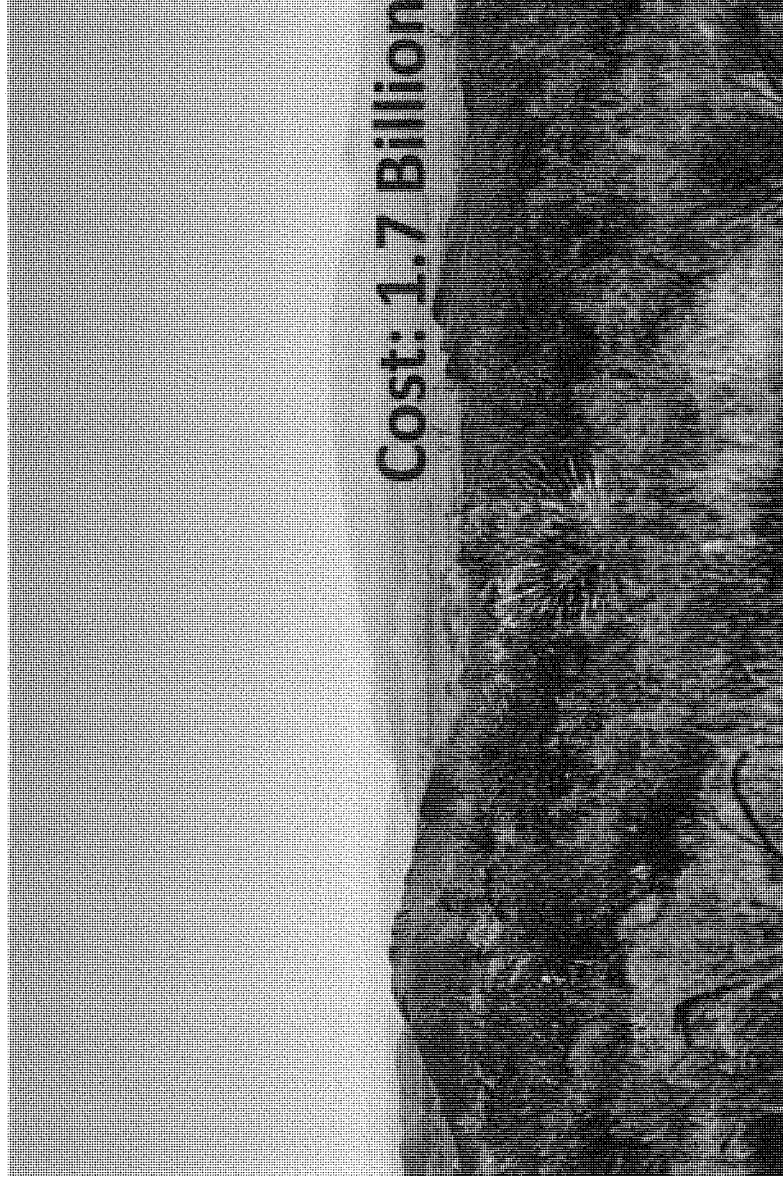
Clean Air Act Regulatory Takeovers of State Programs, by Presidential Administration



Split-Screen: Oklahoma SIP on Left; EPA FIP on Right



Texas SIP on Left; EPA FIP on Right



William Yeatman is a senior fellow at CEI specializing in environmental policy and energy markets.

His commentary has been widely featured in newspapers across America and also on nationwide television and radio. Yeatman has testified numerous times before the Congress and also state legislatures.

Prior to joining CEI, he was a Peace Corps volunteer in the Kyrgyz Republic, where he taught entrepreneurship and small business management to rural women. Before that, he ran a homeless shelter in Denver, Colorado.

He holds a Masters in International Administration from the Denver University Graduate School of International Studies and a Bachelor's in Environmental Sciences from the University of Virginia. During evenings, he pursues a J.D. at the Georgetown University School of Law.

Chairman BRIDENSTINE. Thank you for your testimony.
 I now recognize Mr. Thomas Schroedter, Executive Director and General Counsel of the Oklahoma Industrial Energy Consumers.

**TESTIMONY OF MR. THOMAS P. SCHROEDTER
 EXECUTIVE DIRECTOR,
 OKLAHOMA INDUSTRIAL ENERGY CONSUMERS**

Mr. SCHROEDTER. Thank you, Subcommittee Chairman Bridenstine, and thank you, members, for the opportunity to be here. I am the Executive Director of a trade association called OIEC. It is a trade association of energy-intensive manufacturers, refiners, transporters, and other large energy consumers. They have facilities located throughout the State of Oklahoma and the members companies employ tens of thousands of Oklahomans. Many of those members are engaged in energy-price-sensitive industries such as pulp and paper, cement, refining, industrial gases, plastic, food processing, fertilizer. As I say, these members provide tens of thousands of jobs to the State of Oklahoma.

My testimony is going to address the impact of the Regional Haze Rule on the state. Unfortunately, Oklahoma spent a lot of time coming up with a State Implementation Plan to address Regional Haze but unfortunately that plan was rejected. It was rejected by EPA in December of 2011, and EPA insisted that the State of Oklahoma plan provide for scrubbers on six coal-fired generating units. Now, those scrubbers were very expensive, and the State of Oklahoma determined that the scrubbers were not cost-effective, that they should not be implemented and instead that the utilities in Oklahoma should move to low-sulfur coal and they could comply with Regional Haze by doing that. As I said, EPA disagreed and they imposed—EPA imposed a Federal Implementation Plan.

What happened after that, OG&E went to court, went to the 10th Circuit. PSO, the other investor-owned utility, negotiated a settlement with the EPA. But I want you to know that the bottom line of what's happened or what will happen in Oklahoma is that we will incur substantial rate impacts for all utility ratepayers whether they're residential, whether they're small businesses, whether they're large energy consumers such as my members.

The first year rate increases—and you're going to hear lots of numbers today—but the first year rate increases are estimated to be 11 to 12 percent, but that's only year one. Based on an analysis that we have done, and I don't think that many will disagree with, the OG&E will expend more than \$4.2 billion in excess costs in order to comply with Regional Haze. I have a slide on that.

[Slide.]

The nominal cost to comply over the lifecycle is basically \$4.5 billion. The other utility, PSO, will expend approximately \$5.1 billion more than the Oklahoma State Plan, and the reason PSO's plan is more costly is they are closing their coal plants. They're converting them to natural gas.

These are very serious ramifications, members, that I'm pleased that you've given me the opportunity to share with you. One of the ramifications is that basically we will be left with reliance on natural gas-fired generation, and that means loss of diversity. It's like investing in the stock market and only investing in one stock. We

will be heavily invested in one fuel supply, and that's not good if that price increases.

As you know, as energy rates go up, there's a political for increased unemployment, and we've looked at that, and unfortunately, the regressive nature of the Regional Haze Federal Implementation Plan means that as you get to lower income consumers, the impact is greater because more and more of their income is spent on energy. So this is bad for all consumers, not just large consumers like my members but large consumers. It's bad for Oklahoma. It will impact the competitiveness of Oklahoma. I can tell you that my members, if it becomes too costly to manufacture, will either manufacture in other states or not manufacture their products.

Thank you for the opportunity to be here today and to testify.
[The prepared statement of Mr. Schroedter follows:]

**Testimony of Thomas P. Schroedter
Executive Director
Oklahoma Industrial Energy Consumers (OIEC)**

**Before the U.S. House of Representatives
Committee on Science, Space and Technology
Subcommittee on the Environment**

**March 23, 2016 Hearing
Examining EPA's Regional Haze Program:
Regulations Without Visible Benefits**

My name is Tom Schroedter. I am the Executive Director of Oklahoma Industrial Energy Consumers, otherwise known as "OIEC." OIEC is a non-partisan, unincorporated association of energy intensive manufacturers, refiners and transporters, and other large energy consumers, with facilities located throughout the State of Oklahoma. OIEC member companies employ tens of thousands of Oklahomans.

Many of OIEC's members are engaged in energy price-sensitive industries such as pulp, paper, cement, refining, industrial gases, plastics, food processing, fertilizer, as well as crude oil and refined products transportation and storage.

My testimony will address the impacts of the U.S. Environmental Protection Agency's (EPA) issuance of a final Federal Implementation Plan (FIP) pursuant to the Clean Air Act's Regional Haze Rule, which requires Public Service Company of Oklahoma (PSO) and Oklahoma Gas and Electric Company (OG&E) to add pollution controls to their coal-fired electric generating units in order to comply with EPA's regional haze requirements.

Background

The Clean Air Act requires states to prevent future and remedy existing man-made impairment of visibility in Class I federal areas.¹ The Regional Haze Rule provides that control technologies must meet certain cost-effectiveness tests to protect consumers. In February 2010, the State of Oklahoma submitted a State Implementation Plan (SIP) to EPA identifying how Oklahoma would address the regional haze requirements. The State of Oklahoma determined that six OG&E and PSO coal-fired generating units impacted the Wichita Mountains Wildlife

¹ Clean Air Act Section 169A, 42 U.S.C. Section 7491.

Refuge, which is the only Class I federal area in the State of Oklahoma. That SIP also determined, based upon real-world vendor data, that flue gas desulfurization (scrubbers) was not a cost-effective control technology for meeting regional haze requirements for the six PSO and OG&E coal-fired generating units, and therefore the appropriate Best Available Retrofit Technology (BART) for them was low sulfur coal.

In December 2011, the EPA disapproved portions of Oklahoma's 2010 SIP, rejecting the State's determination that scrubbers were not cost effective, and promulgated a final FIP establishing emission limitations for the six coal-fired generating units that could only be achieved by installing scrubbers, or converting the units to burn natural gas.² Following the issuance of the FIP, PSO and OG&E each filed Petitions to Review the FIP with the 10th Circuit Court of Appeals (10th Circuit).

PSO's Response to EPA's FIP

In October 2012, PSO, along with EPA, the Oklahoma Department of Environmental Quality (DEQ), the Sierra Club and the Secretary of Environment for the State of Oklahoma, entered into a Settlement Agreement to address PSO's compliance with the EPA's FIP for regional haze. As part of that Settlement Agreement, PSO agreed to retire one of its coal units in April, 2016, and retrofit the other coal unit with pollution controls, gradually decreasing the annual energy production levels from that unit before finally retiring it in 2026. Pursuant to the Settlement Agreement, PSO's revised Regional Haze Plan was submitted to DEQ for review and approval, and upon receipt of such approval, submitted to EPA for review and approval. PSO's

² 76 Fed. Reg. 81728 (Dec. 28, 2011). The Regional Haze Rule BART requirements apply to coal-fired generating units constructed between 1962 and 1977. OG&E's Muskogee Generating Unit Number 6 was completed in 1984 and therefore is not subject to the regional haze BART requirements. All other PSO and OG&E coal units are subject to BART requirements.

revised Regional Haze State Implementation Plan (RH SIP) was approved by EPA on March 7, 2014.³

OG&E's Response to EPA's FIP

While PSO pursued its RH SIP, OG&E, Oklahoma's largest investor-owned electric utility with more than 800,000 customers, joined by the State of Oklahoma and OIEC, pursued its Petition to Review in the 10th Circuit. That Petition was rejected by a 2 to 1 vote of a panel of the 10th Circuit, although the court had previously entered an order staying the effectiveness of the FIP while the Petition was pending.⁴ Following the 10th Circuit's denial of a Petition for Reconsideration, OG&E, the State of Oklahoma, and OIEC filed a Petition for Certiorari with the United States Supreme Court, which was denied on May 27, 2014.

Following the 10th Circuit and Supreme Court rulings, OG&E developed a plan for its compliance with the Regional Haze FIP. That compliance plan involves the scrubbing of two of OG&E's five coal-fired generating units and the conversion of two other coal-fired generating units to natural gas. The remaining OG&E coal-fired generation unit is not subject to regional haze BART requirements and therefore will be able to continue to operate without scrubbers. OG&E has until January 2019 to comply with the Regional Haze FIP.

Rate and Other Impacts of OG&E and PSO EPA Regional Haze Compliance

While experts may differ as to whether EPA's Regional Haze program will have a perceptible impact on visibility in the Wichita Mountains National Wildlife Refuge, there is no

³ 79 Fed. Reg. 12944 (Mar. 7, 2014).

⁴ *Oklahoma v. U.S. E.P.A.*, 723 F. 3d 1201 (10th Cir. 2013). Judge Kelly, in his dissent, noted: "The EPA rejected Oklahoma's cost estimates for scrubbers and provided two options of its own. These options arbitrarily and capriciously (1) assumed OG&E would burn coal they are not burning and have no plans to burn and (2) used scrubbers that do not fit and are not technically feasible." *Id.*, at 1225. Further, he determined that "[t]he EPA rejected Oklahoma's evidentiary support with no clear evidence of its own to support its contrary conclusion." *Id.*

doubt that OG&E's Plan for compliance with EPA's FIP and PSO's RH SIP will result in substantial adverse impacts to PSO and OG&E ratepayers. OG&E's Plan for Compliance with EPA's FIP, and PSO's revised RH SIP, will drive up electricity costs while providing little, if any, benefit to utility ratepayers.

While the Clean Air Act provides broad authority to both states and EPA to develop plans to make reasonable progress to improving visibility in Class 1 federal areas, it is OIEC's belief that the Act does not authorize EPA to replace and supersede the State's authority to determine BART or to ignore the cost-effectiveness test that must be met by control technologies to qualify as BART⁵. Unfortunately, when EPA disapproved the State's determination of BART for PSO and OG&E's six coal-fired generating units, EPA superseded the State's discretion as to how the applicable regional haze standards are to be met. While the State of Oklahoma complied with the step-by-step BART process, EPA determined otherwise when promulgating its FIP for the State of Oklahoma.

There is no doubt that EPA's FIP will result in substantial rate increases for OG&E and PSO ratepayers. For example, an initial analysis conducted by OG&E reflects that EPA's FIP would be \$2.4 billion more costly for OG&E ratepayers than Oklahoma's proposed 2010 SIP. Moreover, that same analysis of an alternative scenario referenced in the FIP (conversion of coal-fired power plants to burn natural gas) reflects that the FIP would cost approximately \$5.4 billion more than the SIP on a present value basis. Based on OIEC's most recent analysis, OG&E's customers are expected to pay in excess of \$4.2 billion more on a nominal cost basis over the next 25 years as a result of EPA's regional haze FIP when compared to the Oklahoma SIP. The initial rate impact of the OG&E compliance plan for EPA's regional haze FIP is

⁵ Clean Air Act Section 169A(g)(2), 42 U.S.C. Section 7491(g)(2).

estimated to be approximately \$241 million per year which would represent a first year rate increase of approximately 12%.

The economic impact of PSO's RH SIP likewise will have substantial adverse impacts on PSO ratepayers. PSO's RH SIP requires the retirement of PSO's Northeastern 3 coal-fired generating unit in April 2016 (25 years before the end of its useful life), and the retirement of the Northeastern 4 unit by 2026. OIEC estimates that PSO ratepayers will expend approximately \$5.1 billion on a nominal basis over the next 25 years for regional haze compliance when compared to what ratepayers would have paid under the Oklahoma SIP.⁶ It is estimated that PSO's electric rates will increase by approximately \$148 million per year, which would represent a year one rate increase of approximately 11% as a result of the Regional Haze Rule.⁷

These rate hikes will harm industrial consumers of electricity such as OIEC members, and also residential customers and small businesses, and are also expected to have a significant adverse effect on Oklahoma's economy. For OIEC member companies, a major rate increase will impact productivity, stifle expansion and, in a worst case scenario, drive energy-intensive businesses to states that offer more favorable electricity rates or to foreign countries. Unfortunately, such a result was not considered in EPA's analysis of the cost effectiveness of regional haze control alternatives and in EPA's imposition of its FIP.

Moreover, the potential for economic disruption due to the Regional Haze Rule is significant because of the possible potential for rate shock and electric reliability ramifications. Both OG&E and PSO have relied heavily on their coal-fired generating assets to produce baseload power because these assets are the lowest cost resources on their systems.

⁶ Responsive testimony of OIEC witness Scott Norwood filed in OCC Case No. PUD201200054 (Jan. 2013).

⁷ Comments of Oklahoma Industrial Energy Consumers on the March 20, 2013 [Proposed] Revision of Regional Haze State Implementation Plan, p. 8 (May 17, 2013).

Unfortunately, EPA's approval of PSO's RH SIP will decrease the level of coal-fired generating capacity on PSO's system from 40% to 3%.⁸ The resulting decline in fuel diversity has clear disadvantages for Oklahoma in that it exposes Oklahoma ratepayers to a risk of rate shock in the event of natural gas price volatility in the future or supply disruptions. Moreover, when the first PSO coal-fired unit is retired next month, the Company must purchase or build additional capacity to replace the void of 470 MW of retired capacity, which could potentially result in decreased system reliability unless these retired MW are replaced entirely for the remaining life of the retired units. If the company replaces all of that capacity, its customers will bear the cost of the replacement capacity in addition to much higher replacement energy costs and all of the other costs associated with implementing PSO's RH SIP.⁹

There is also the potential for increased unemployment. Based on figures from the U.S. Bureau of Labor Statistics and Management Information Services, Inc., PSO's RH SIP could result in the loss of up to 50,000 jobs in Oklahoma, which would increase Oklahoma's unemployment.¹⁰

Finally, electric utility price increases of the magnitude discussed earlier in my testimony will impose real burdens on Oklahoma's citizens. The following points highlight the energy impacts on Oklahoma households:

- Oklahoma households spend an average of 12% of their after-tax incomes on energy;
- 827,000 Oklahoma households earning less than

⁸ Comments of the Consumer Coalition of Oklahoma, p. 6, to EPA Docket No. EPA-R06-OAR-2013-0227 (Sep. 20, 2013) (Consumer Coalition Comments).

⁹ Oklahoma Attorney General Comments, p. 3, to EPA Docket No. EPA-R06-OAR-2013-0227 (Sep. 20, 2013).

¹⁰ Consumer Coalition Comments, p. 6.

\$ 50,000 per year (roughly 60% of households) spend 21% of their after-tax incomes on energy;

- 381,000 Oklahoma households with annual incomes of \$10,000 to \$30,000 (more than 25% of the State's population) spend 25% of their after-tax income on energy; and
- The 134,000 poorest Oklahoma households with annual incomes of less than \$10,000 spend upwards of 60% of their after-tax income on energy.¹¹

The bottom line is that the State of Oklahoma already has a disproportionately high energy burden, and the Regional Haze Program will increase these burdens, which will have related economic and personal consequences.

Conclusion

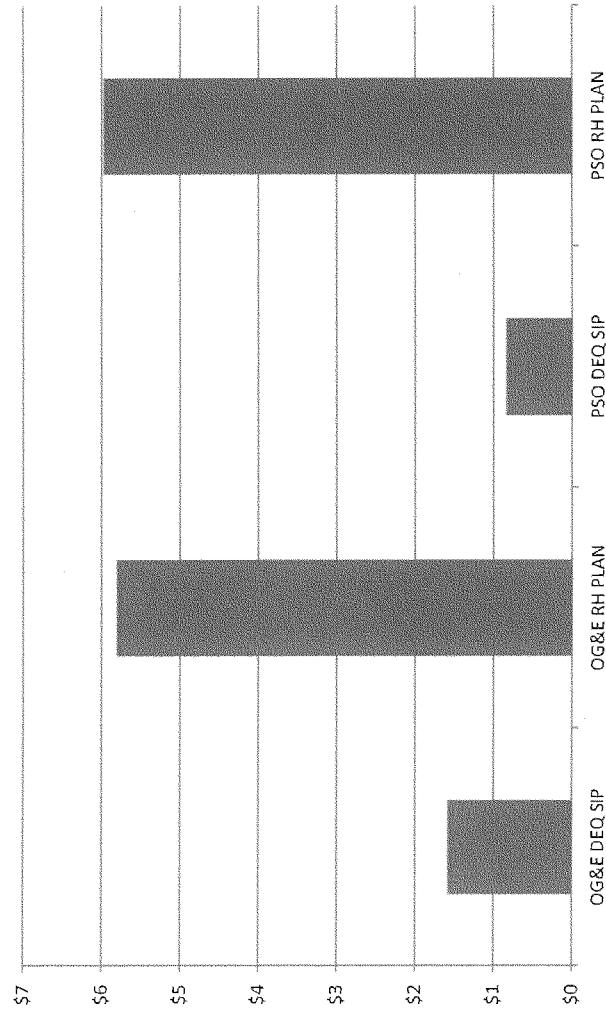
Please address these harmful impacts which will result from EPA's regional haze requirements by developing a statutory remedy to the Clean Air Act/Regional Haze Rule, clarifying that states shall perform any BART analysis and EPA should not second-guess that analysis. In addition, please ensure that any BART analysis consider both direct and indirect costs of regional haze compliance and the effects on ratepayers

Thank you for the opportunity to present this testimony.

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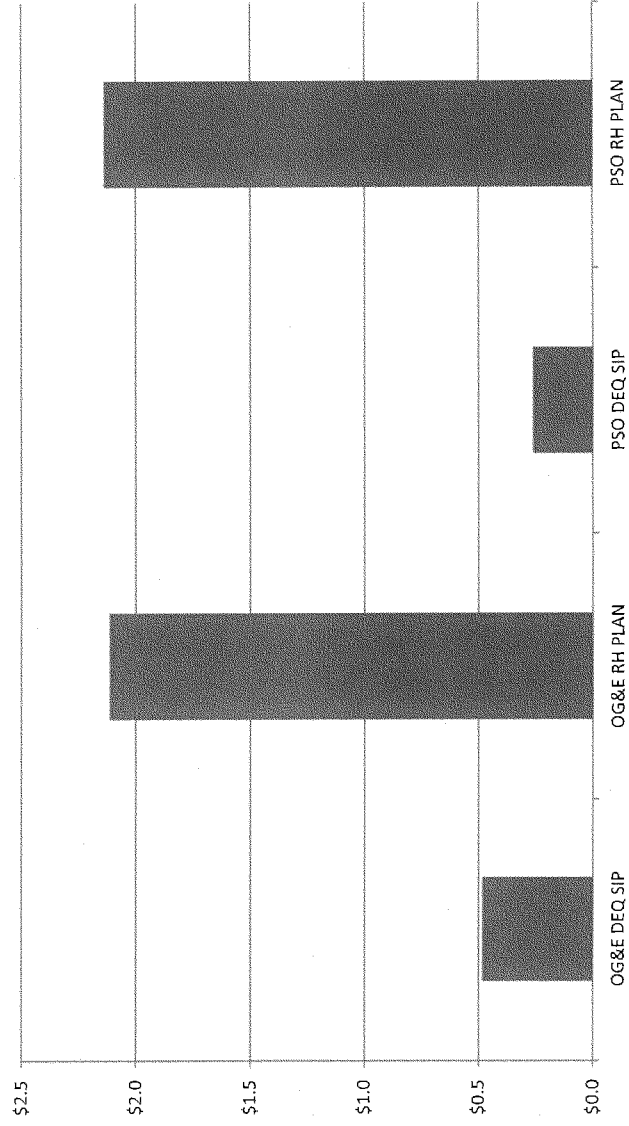
¹¹ Consumer Coalition Comments, p. 7.

**COMPARISON OF COSTS OF OKLAHOMA DEQ SIP COMPLIANCE PLANS
TO OG&E/PSO REGIONAL HAZE (FIP) COMPLIANCE PLANS
(2017-2042, NOMINAL, \$BILLIONS)**



Estimates prepared by Norwood Energy Consulting based on public information from US Energy Information Administration and Utility Integrated Resource Filings

**COMPARISON OF COSTS OF OKLAHOMA DEQ SIP COMPLIANCE PLANS
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(2017-2042, 2016 PRESENT VALUE, \$BILLIONS)**



Estimates prepared by Norwood Energy Consulting based on public information from US Energy Information Administration and Utility Integrated Resource Filings

**Summary of Testimony of Thomas P. Schroedter
Executive Director
Oklahoma Industrial Energy Consumers (OIEC)**

- In December 2011, EPA, disapproved portions of Oklahoma's 2010 State Implementation Plan for Regional Haze compliance (Oklahoma SIP) and promulgated a final Federal Implementation Plan (FIP) establishing emission limitations for six coal-fired generating units owned by the investor-owned utilities, OG&E and PSO
- EPA determined that Best Available Retrofit Technology (BART) could only be achieved through installing scrubbers to the six coal units
- In response, OG&E pursued a legal challenge to EPA's FIP, while PSO entered into a settlement agreement with EPA and others to address compliance with EPA's FIP
- PSO's Settlement (and resulting EPA approved Regional Haze SIP) provides for the retirement of one coal unit by April 2016 and the retrofit of the other coal unit with scrubbers by 2026
- OG&E's legal challenge to EPA's FIP was rejected by the 10th Circuit in a 2-1 vote, although the Court previously entered an Order staying the effectiveness of the FIP while the legal challenge was pending
- Following rejection of its legal challenge, OG&E developed a plan for compliance with EPA's Regional Haze FIP, which involves the scrubbing of two of OG&E's five coal-fired units and the conversion of two other coal-fired units to natural gas by 2019
- There is no doubt that OG&E and PSO's environmental compliance with EPA Regional Haze requirements will result in substantial adverse impacts to PSO and OG&E ratepayers
- The first year rate increases for customers of PSO and OG&E are anticipated to be in the range of 11-12%, as compared to the rate impact of the State of Oklahoma's December 2010 SIP
- Based on OIEC's most recent analysis, OG&E's customers are expected to pay in excess of \$4.2 billion more on a nominal cost basis over the next 25 years as a result of the RH FIP, when compared to Oklahoma's initial SIP for OG&E's compliance with the FIP
- The economic impact for PSO ratepayers is similar and likewise devastating. It is estimated that PSO ratepayers will expend approximately \$5.1 billion more on a nominal basis over the next 25 years for regional haze compliance than what ratepayers would have paid under the Oklahoma SIP

- OG&E Regional Haze FIP compliance plan and PSO's RH SIP will substantially decrease the level of coal-fired generating capacity on PSO and OG&E's systems, exposing Oklahoma ratepayers to a risk of rate shock in the event of natural gas price volatility or supply disruption
- The potential for economic disruption due to EPA regional haze compliance is also significant because of the potential for both rate shock and electric reliability issues. OG&E and PSO rely heavily on their coal-fired generating assets because these assets provide baseload power and are by far the lowest cost energy resources on their systems
- There is also the potential for increased unemployment resulting from increased electric costs as PSO's regional haze compliance could result in job losses of up to 50,000. OG&E ratepayers could experience similar job losses
- The State of Oklahoma already has a disproportionately high energy burden and EPA's regional haze rule will increase these burdens
- Please address these potential harmful impacts to Oklahoma ratepayers and ratepayers impacted in other states by developing a statutory remedy to Clean Air Act/Regional Haze Rule compliance, clarifying that states shall perform any BART analysis and that EPA shall defer to the state's analysis. In addition, ensure that any BART analysis must consider both direct and indirect costs of regional haze compliance and the effects on ratepayers

Thomas P. Schroedter
Biographical

Thomas P. Schroedter serves as Executive Director and General Counsel of Oklahoma Industrial Energy Consumers (OIEC), an unincorporated association of Oklahoma manufacturing, refining and other companies that consume significant quantities of energy to operate their Oklahoma facilities. Mr. Schroedter represents OIEC in regulatory proceedings before the Oklahoma Corporation Commission and in dockets before the Federal Energy Regulatory Commission.

Mr. Schroedter has served as OIEC's executive director for more than 15 years, advocating for reliable and lowest, reasonable cost energy supply for OIEC member companies. Mr. Schroedter represents OIEC in state and federal courts and at the Oklahoma State Legislature and advises OIEC members on electric power and natural gas issues impacting the delivery and cost of energy to industrial end-use consumers.

As a shareholder in the Tulsa-based law firm Hall Estill, Mr. Schroedter also provides legal representation to other firm clients in connection with the exploration, production, transportation and consumption of energy, including advice and analysis regarding state and federal electric power and natural gas issues impacting the rates and terms of delivery of energy to end-use customers.

Mr. Schroedter has served as an adjunct professor at the University of Tulsa College of Law, teaching courses in oil and gas contracts and transactions. He has also been appointed to several state legislative commissions, including Oklahoma's Oil and Gas Production Practices Commission, Oklahoma's Commission on Natural Gas Policy, Oklahoma's Clean Energy Independence Commission, and Arkansas' Task Force concerning EPA's greenhouse gas rules.

Chairman BRIDENSTINE. Thank you for your testimony.

And so everybody knows, the panelists have submitted testimony that is much longer than that is all made part of the record, so that will be available for everybody.

Our next witness is Mr. Bruce Polkowsky, an Environmental Policy Consultant. You're recognized for five minutes.

**TESTIMONY OF MR. BRUCE POLKOWSKY
ENVIRONMENTAL POLICY CONSULTANT**

Mr. POLKOWSKY. Thank you, Chairman Bridenstine, Ranking Member Bonamici, and Committee Ranking Member Johnson, for the opportunity to speak to you about my experiences with EPA's visibility protection program.

Our National Parks and wilderness areas are treasures of immense cultural and spiritual importance. Visitors expect and value clean, clear air. Those visitors generate billions of dollars and thousands of jobs at local gateway communities, and studies show that many Americans who may not visit these areas nevertheless value protecting visibility for future generations.

Section 169(a) of the Clean Air Act establishing the national goal of preventing and remedying manmade impairment of visibility in our large National Parks and wilderness areas and requiring EPA to issue rules for states to provide reasonable progress towards that goal reflects the expectations and values of most Americans.

EPA's visibility program has developed slowly, very slowly from 1980 on to now, but it's done so in conjunction with advances in scientific techniques to understand the components and sources of the plumes and haze, and the regulatory program has developed slowly with input from states and tribes. Particularly when I was working on the Regional Haze rules at EPA, I took into account recommendations of the Visibility Transport Commission for the Grand Canyon that was established by Section 169(b), and incorporated aspects of targeting the clearest days for protection and targeting the most impaired days for improvement that came directly from the Commission as well as the glide path concept of moving towards natural conditions based on the Grand Canyon Commission's projected 40 to 70 percent reduction of sulfur dioxide across an eight-state region.

So the program has also spurred technical innovation in the monitoring program, a network that has been formed for federal agencies, states and academic institutions to develop equipment and techniques for routine capturing and analyzing the chemical makeup of atmospheric particles, those techniques were proven in parks and wilderness areas and then became the foundation for the monitoring of those same particles in urban areas to implement the Fine Particle Health Standard.

And EPA has fostered innovative implementation as well. In some actions to control pollutants from sources subject to Section 169's Best Available Retrofit, or BART technology, which must be implemented within five years, EPA has shown great flexibility in seeing value in attaining greater improvements over a longer period of time at a lower cost. EPA has also considered multi-pollutant benefits when weighing alternatives to controlling a single pollutant under BART.

Over the nearly four decades since Congress established the national goal for our most treasured lands, there has been significant progress in improving visibility in many but not all locations. These improvements reflect emission reductions that lowered atmospheric concentrations of fine particles resulting from different regulatory programs. Some focused on protecting human health, others on reducing harmful effects on public welfare and ecosystems such as acid rain, and some were taken specifically to address visibility. As the National Academy of Sciences noted in their 1993 report on protecting visibility, pollutant emission reductions that lower ambient concentrations of fine particles will improve the health, welfare and visibility regardless of which regulatory program required the reduction.

There is still work to do to maintain progress towards the national goal. States and EPA each have very important roles in continuing to make that progress, but given the complex atmospheric chemistry and meteorology that form and transport fine particles over long distances coupled with the sensitivity of clean atmosphere to small increases in fine particle concentrations, EPA has a unique role in assuring that implementation plans of all the states and tribes fit together to continue to make progress towards the national goal.

And one comment I have about the number of FIPs. In 1984, I had to issue 35 FIPs for visibility protection for the 1980 rule, so there is precedent in looking at when a new series of programs is required for the EPA to look state by state.

So again, thank you for this opportunity, and I'm glad to answer any questions you may have.

[The prepared statement of Mr. Polkowsky follows:]

Before the United States House Committee on Science, Space, and Technology
Subcommittee on the Environment

History and Implementation of the Clean Air Act Visibility Protection Provisions
Testimony of Bruce Polkowsky
Environmental Science, Technology and Policy Consultant

March 23, 2016

Chairman Bridenstine, Ranking Member Bonamici and Members of the Subcommittee, thank you for the opportunity to testify about the U.S. Environmental Protection Agency's Regional Haze Regulations.

My name is Bruce Polkowsky. I am an independent contractor working with many parties to find innovative ways to implement provisions of EPA's visibility protection requirements and related environmental protection programs. I previously served as a policy analyst with the National Park Service's Air Resources Division, and before that as an Environmental Engineer in the U.S. Environmental Protection Agency's Office of Air Quality Planning and Standards. In both positions, I served under Republican and Democratic Administrations.

The nation's large national parks and wilderness areas are treasures of immense importance to all Americans and the world. Upon visiting the Grand Canyon in 1903, President Theodore Roosevelt remarked, "Leave it as it is. You cannot improve on it. The ages have been at work on it and man can only mar it. What you can do is keep it for you children, and for all who come after you, as the one great sight which every American...should see." Starting with the Organic Act in 1916 creating the National Park Service, expanded by the 1964 Wilderness Act and specifically in the 1977 Amendments to the Clean Air Act, the Congress has recognized, with overwhelming bipartisan support, the need to protect the scenic views of large national parks and wilderness areas, leaving them "unimpaired" for the enjoyment of future generations.¹

Ninety-five percent of the National Park Service visitor studies conducted in the national parks protected by the visibility protection regulations over the last 20 years, covering over 10,000 groups of visitors, list scenic views as extremely important or very important, with 95 percent ranking scenic views as the first, second, or third most important attribute out of 14 total choices.²

¹ 16 U.S.C. § 1, National Park Service Organic Act and Public Law 88-577(16 U.S.C. 1131-1136) Wilderness Act

² National Park Service Visitor Values & Perceptions of Clean Air, Scenic Views & Dark Night Skies, 1988-2011, Natural Resource Report NPS/NRSS/ARD/NRR-2013/632

The near 40-year implementation of the Clean Air Act's visibility protection provisions has been based on a careful examination of science, incremental promulgation of regulatory requirements, and extraordinary interagency cooperation that includes other federal agencies, tribes and States. Starting with a monitoring program in 1985, the States have been part of the management and development of science and policy decisions. The Grand Canyon Visibility Transport Commission (1991-1996) provided direct input to the Regional Haze Regulations. The Commission was led by the Governors of eight States and the leaders of four Indian Tribes, with five Federal Agencies having non-voting advisory roles.³ From 2000 to 2009, EPA provided funding for five Regional Planning Organizations (RPOs) that provided forums for all States and Tribes to build scientific information on the causes of visibility impairment in their region and to develop cooperative strategies to incorporate in State Implementation Plans. The National Park Service, U.S. Fish and Wildlife Service, Forest Service and Bureau of Land Management, all supported the RPO's with technical assistance.

In 1993, the National Academy of Sciences (NAS) reviewed the state of the science for visibility protection and determined that "[p]rogress toward the national goal of remedying and preventing man-made visibility impairment in Class I areas (Clean Air Act, Section 169(a)) will require regional programs that operate over large geographic areas and limit emissions of pollutants that can cause regional haze." The NAS also concluded that "[r]educing emissions for visibility improvement could help alleviate other air-quality problems, just as other types of air-quality improvements could help visibility"⁴. The design and implementation of control strategies for visibility protection should also account for collateral improvements in human health and ecosystem conditions.

Protection of visibility at our most treasured parks and wilderness areas drives economic progress in those regions and nationally. The National Park Service estimates the national park system received over 292 million recreational visits and those visitors spent \$15.7 billion in local gateway communities. The contribution of this spending to the national economy was 277 thousand jobs, \$10.3 billion in labor income, \$17.1 billion in added value, and \$29.7 billion in output.⁵ As noted above the vast majority of these visitors generating this economic benefit value the protection of scenic views. A Clean Air Task Force report estimates that improving visibility at national parks would increase spending significantly.⁶

³ The Grand Canyon Visibility Transport Commission, Recommendations for Improving Western Vistas, June 10, 1996

⁴ Protecting Visibility in National Parks and Wilderness Areas, National Research Council, National Academy Press, Washington, D.C. 1993

⁵ 2014 National park Visitor Spending Effects, NPS, Natural Resource Report NPS/NRSS/EQD/NRR-2015/947

⁶ Out of Sight: The Science and Economics of Visibility Impairment, Abt Associates, Inc., 2000

The visibility protection program is built on firm science and has reflected a data driven approach to protecting our nation's grand vistas anchored in a partnership with federal agencies, states and tribes. Nearly 40 years after Congress established the national goal of preventing and remedying air pollution to protect scenic vistas in our national parks, EPA is moving ahead with the long overdue measures to address the regional haze impairment.

I. 1977 Clean Air Act Amendments establish a National Goal and mandate EPA Regulations in Section 169A

The 1977 Clean Air Act Amendments declared as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.⁷ Congress specifically recognized that the "visibility problem is caused(?) primarily by emission into the atmosphere SO₂, oxides of nitrogen, and particulate matter, especially fine particulate matter from inadequate[ly] controlled sources."⁸

The 1977 amendments recognized that the national ambient air quality standards would not prevent air quality in very clean areas, such as the desert southwest, from serious degradation which would threaten the character of the region as well as the scenic qualities that were behind formation of many of the nation's national parks and wilderness areas. In its 1979 Report to Congress on the nature and causes of visibility impairment, EPA stated that due to the physics of light transmission through the atmosphere, a very small amount of fine particulates added to a clean atmosphere will degrade the vista more than the same amount added to an already impaired atmosphere. The addition of 1 microgram per cubic meter of fine particles, spread throughout the viewing path, to a clean atmosphere could reduce visual range by about 30 miles, from approximately 200 to 170 miles. Adding the same amount of fine particles to conditions of 20-mile visibility would decrease visual range less than 1 mile.⁹ So while the pollutants of concern are the same for protection of visibility as those for the protection of human health, it is necessary to have a regulatory structure that specifically addresses visibility protection to assure that appropriate strategies address the full spectrum of atmospheric conditions and advance the objective of restoring natural air quality to protected public lands.

In 1980, the EPA promulgated regulations to address manmade impairment associated with specific sources located near class I Federal areas, but delayed action on impairment associated with emissions from multitudes of sources over broad geographic areas until the science of visibility monitoring and regional-scale air quality modeling advanced.¹⁰

⁷ 42 U.S.C. § 7491(a)(1).

⁸ H.R. Rep. No. 95-294 at 204 (1977).

⁹ "Protecting Visibility, An EPA Report to Congress" 1979

¹⁰ 45 FR 80086.

The 1980 regulations established requirements for the 35 States and one territory containing mandatory class I Federal areas to address visibility protection. The visibility program follows the long established structure of having States develop plans with EPA retaining oversight. A unique aspect of the visibility protection plans is that States consult with the class I Federal land management agencies during the development of implementation plans affording an exchange of technical expertise.

II. 1990 Clean Air Act Amendments focus attention on regional haze

By adding Section 169B to the Clean Air Act in 1990, Congress required EPA to conduct research on regional haze impacts in cooperation with the National Park Service and other Federal agencies. Section 169B required the establishment of a Visibility Transport Commission focused on the region affecting the Grand Canyon National Park. The Commission issued its final report in 1996.¹¹ Section 169B required EPA to issue regulations to address regional haze at mandatory class I Federal areas within 18 months of receiving the Commission's report. EPA issued final Regional Haze Regulations on July 1, 1999.¹²

The implementation of the Regional Haze Regulations was coordinated with implementation of the new fine particulate national ambient air quality standards as required by the Transportation Equity Act for the 21st Century, Public Law 105-178. EPA adjusted the SIP deadline so that States participating in regional planning organizations could coordinate technical and policy assessments with efforts to implement the fine particle national ambient air quality standard.¹³ With participation in regional planning activities States had to submit regional haze plans to EPA by December 17, 2007.

III. Implementation of the Regional Haze Rules

From 2001 to 2008, most States and many Tribes participated in five regional planning organizations (RPOs), supported by EPA funding for technical analysis and policy consultation. The EPA and the class I area Federal land management agencies participated in the RPOs providing technical expertise and working in partnership with States and Tribes on the development of the regional haze plans, consistent with statutory requirements calling for plan development in consultation with the Federal Land Managers.

IV. EPA's Partnership with States, Tribes and Federal Land Managers

¹¹ Grand Canyon Visibility Transport Commission, Recommendations for Improving Western vistas, Report to U.S. EPA, June 10, 1996.

¹² 64 FR 35714

¹³ 64 FR 35724

Beginning with the 1980 rules, through a multi-agency collaboration in the collection of visibility monitoring data in mandatory Federal Class I areas, and including development of the Regional Haze Rules, EPA has had a long partnership with the States, Tribes and Federal Land Managers in designing the visibility protection program. Yet, EPA must provide safeguards when necessary to protect human health and the environment including the grand vistas of our national parks. EPA has shown flexibility in approving State regional haze plans when those plans meet the requirements of the regional haze program. As exemplified in the following cases, several plans are illustrative of a broad, forward-looking stakeholder approach;

A. Colorado's Clean Air Clean Jobs Act.

In 2010 Colorado undertook an approach that examined current and reasonably foreseeable air quality requirements, such as new ambient air quality standards for ozone, safeguards to address carbon pollution, efforts to address hazardous air pollution, such as mercury and regional haze. Consideration was given to emerging scientific concerns with nitrogen deposition at high altitude lakes in Rocky Mountain National Park. The Colorado General Assembly enacted a coordinated multi-pollutant, energy and air quality strategy to address emissions from the electric utility sector over a large area of the State. The resulting air quality management plan, adopted by the Colorado Air Quality Control Commission, addressed the best available retrofit technology (BART) requirement for most sources in the state. The local power company developed cost-effective, integrated solution that included the installation of control technologies, a transition to inherently clean energy resources, and repowering to natural gas.

The costs for the program underwent review by the Public Utilities Commission. The plan was submitted to EPA in 2011 with bi-partisan support of the State legislature, Governor, and the full Colorado Congressional delegation.¹⁴ The EPA proposed approval of the Colorado regional haze plan in March, 2012, and completed approval in December, 2012.¹⁵

B. BART for nitrogen oxide emissions from Navajo Generating Station.

In February 2013, EPA proposed a BART emission limitation to reduce emissions of nitrogen oxides (NO_x) from Navajo Generating Station (NGS), located on the Navajo Nation, building from an action years earlier to limit the plant's sulfur dioxide contributing to pollution of the Grand Canyon. The EPA determined that NO_x emissions from NGS significantly degraded visibility at 11 class I areas. EPA simultaneously proposed a "BART Alternative" as well as a framework to evaluating

¹⁴ Letter to Administrator Jackson, December 16, 2011, from Senators Udall, Bennett, Representatives Degette, Lamborn, Perlmutter, Coffman, Polis, Gardner, Tipton.

¹⁵ 77 FR 76871

other BART alternatives related to an emissions cap. EPA's proposed alternative to BART encouraged the submittal of other solutions to address the plant's visibility-impairing emissions consistent with EPA's emissions framework under its Clean Air Act responsibilities. After consideration of further public comment and input, EPA adopted an approach jointly recommended by diverse interests including the Salt River Project, the U.S. Department of the Interior (DOI), the Gila River Indian Communities, the Navajo Nation, the Central Arizona Water Conservation District, Environmental Defense Fund, and Western Resource Advocates. The recommendations of this joint technical working group included a combination of solutions to reduce multiple pollutants at the plant, support the development of clean energy for the affected Indian Tribes, reduce water consumption, and address local impacts on families and communities in the vicinity of the plant and its coal mine.

C. BART for nitrogen oxide emissions from Four Corners Power Plant.

On October 19, 2010 EPA proposed a BART determination for the Four Corners Power Plant (FCPP), located on the Navajo Nation, that required an 80 percent reduction in emissions of nitrogen oxides. At the time of proposal the FCPP was the largest single source of nitrogen oxides emissions in the country. The nitrogen oxide emission from FCPP degraded visibility at 16 national parks and wilderness areas. After the EPA proposal, Arizona Public Service (APS), the operator of the FCPP, proposed an alternative providing greater emissions reductions than EPA's proposal but over a longer time period. This approach had the added benefit of reducing sulfur dioxide, more particulate matter, mercury and CO₂ as well as reducing water consumption at the plant. On August 24, 2012 EPA promulgated the APS alternative.¹⁶

As demonstrated in part by the above examples, States, Tribes and EPA are effectively carrying out vital responsibilities to protect scenic vistas in national parks -- lifting the veil of haze polluting our nation's grand vistas -- while working in partnership with all stakeholders.

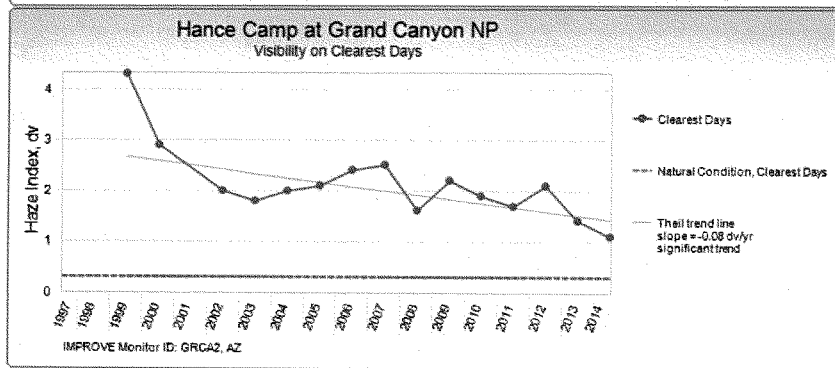
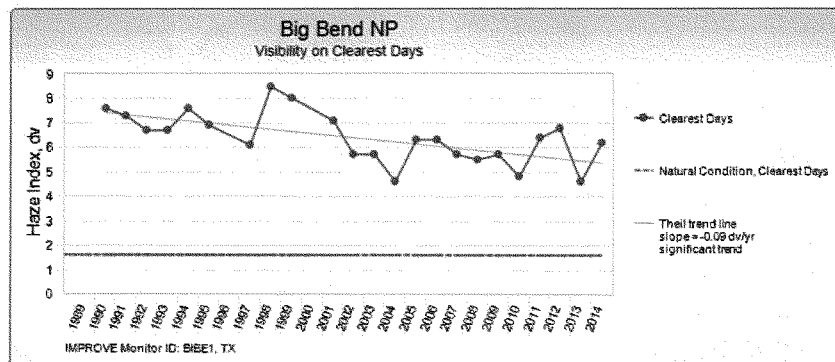
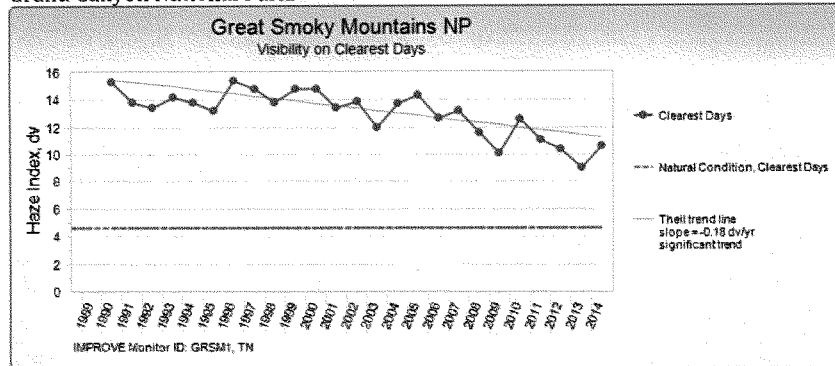
V. Building on the Foundation of Science and Intergovernmental Partnerships to Protect the Grand Visas in America's National Parks and Wilderness Areas

As we near the end of the first implementation period of the regional haze rules, there are lessons for states, tribes and EPA as government policymakers work together on the next round of plan revisions that will focus on ongoing "reasonable progress" toward the national visibility goal.

One of the most interesting developments over the years since the promulgation of the regional haze rule is that in almost every mandatory Federal Class I area there has been a statistically significant trend of improvement in visibility on the clearest

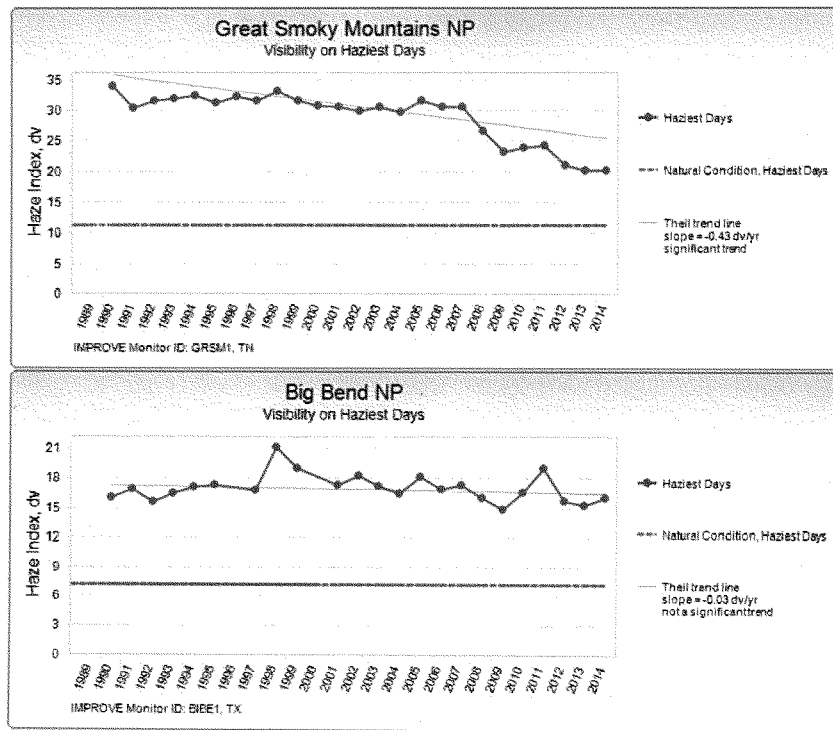
¹⁶ 77 FR 51620

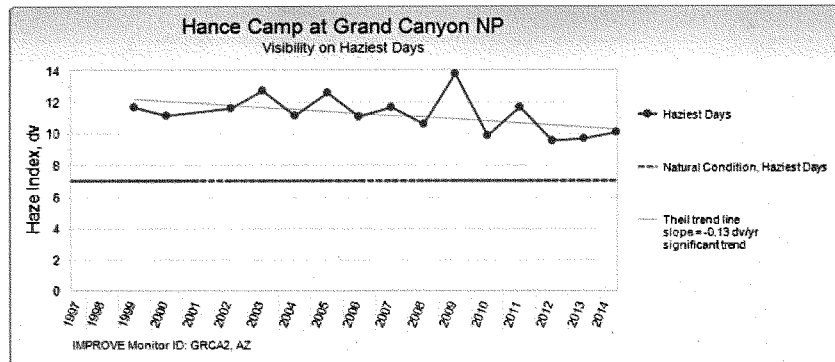
20 percent days. As shown the following graphs this is true at mandatory locations as varied as Great Smoky Mountains National Park, Big Bend National Park and Grand Canyon National Park.



Looking at the constituents of the fine particulate matter at these locations, these trends are likely due to national decreases in ammonium sulfate concentrations. Ammonium sulfate particles are predominantly formed from emissions of industrial and mobile sources of sulfur dioxide. These emissions have declined dramatically over the last 20 years. Since small changes in fine particle concentrations will improve clearer atmospheric conditions more than hazier days, this result indicates that the regional pollution reductions will shift the entire distribution of visibility by increasing the number of clearer days per year.

Making progress toward the natural conditions on the haziest days is more of a challenge, particularly for the parks and wilderness areas of the intermountain west as the graphs for the haziest days in the same three locations indicate:





Examination of the fine particle components measured at these locations on the most impaired days also show decreases in ammonium sulfate at Great Smoky Mountains NP and Grand Canyon NP. The regional programs emissions programs for NAAQS and acid rain plus national reductions in the sulfur content of fuels are the likely the reason for sulfate reductions at Great Smoky Mountains. The improvement in sulfate concentrations at Grand Canyon NP likely resulted from controls at Navajo Generating Station and the national fuel program. The lack of a significant trend at Big Bend NP reflects little change in ammonium sulfate levels in this region.

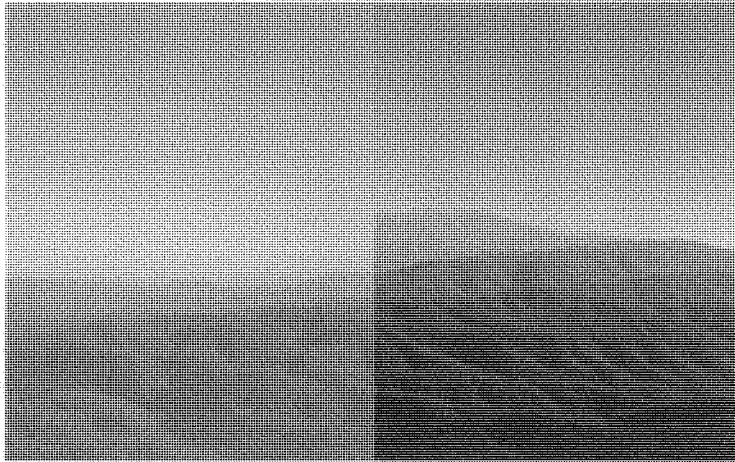
The visibility protection program to date has been a cost-effective, cooperative effort that has reduced degradation of the clearest days and has both tracked significant improvement driven by other air quality programs and contributed to significant improvement in select areas. The implementation of the regional haze strategies is just beginning and must provide continued protection and improvement. It is important to note that while overall the trend is positive, there is not a single Class I area national park or wilderness in the country that has achieved the natural air quality conditions goal of the Clean Air Act. Through policy anchored in science, clean air solutions, and intergovernmental partnerships, we have made important progress in protecting and enhancing premier scenic vistas. We need to continue to build from this foundation to fulfill the national goal of both preventing and remedying air pollution impairing protected national parks and wildernesses.

The following images illustrate the progress of addressing visibility impairment of the 20 percent most impaired days at the three Class I areas.¹⁷ The left side of the

¹⁷ Winhaze images for the mean 20% hazeiest Days 1989-2012, Jenny Hand, Air Resources Specialists, March 13, 2014 <http://www.air-resource.com/resources/downloads.html>, Note: figure for Grand Canyon is Hopi Point monitoring station, the older station no longer used for trends. Data for 2012 is very similar to Hance Camp data, so image is reflective of the air quality change.

image shows the average visibility conditions of most impaired days in 1990 based on the average fine particulate concentrations measured on those days. The right side of the image shows the average visibility conditions for the 20 percent most impaired 20 days in 2012.¹⁸

Great Smoky Mountains National Park, TN
1990-2012



A change from 34 deciviews to 21 deciviews.

¹⁸ Review of Federal Land Manager Environmental Database found at <http://views.cira.colostate.edu/fed/SiteBrowser/Default.aspx>

Big Bend National Park, TX
1990-2012



Both years averaged 16 deciviews.

Grand Canyon National Park, AZ
1990-2012



A change from 13 deciviews to 10 deciviews .

Going forward EPA has the opportunity continue its cooperative approach to protecting visibility. EPA can work with States and Tribes in using the next generation of air quality modeling in conjunction with the now rich national database on the composition of fine particulate matter to explore effective strategies for protection and improvement of visibility.

VI. Conclusion

Our nation has a tremendous bipartisan tradition of protecting our iconic natural places as a legacy for current and future generations. Together, we have made important progress. But our work is not done. Our nation must continue to work together to protect our national parks and wilderness areas – and the grand vistas that are integral to their preservation and enjoyment.

Many of economic valuation studies from 1980 through 2000 show large economic benefits attributed to increased recreational use, to preservation of recreational use for future generations, to value of urban visibility improved as a result of multiple air quality programs. While summarizing the results of studies across many regions of the country is difficult, a review of the various valuation studies found that protection of recreational visibility benefits had a value that ranged from \$358 million to approximately \$6 billion.¹⁹

It is also important to recognize that any pollution control required for protection of visibility will have collateral benefits for public health by reducing human exposure to fine particulate matter. Controlling emissions of nitrogen oxides for visibility in areas of the west where ozone formation is limited by availability of nitrogen oxidants would also result in lowered human exposure to ozone and its associated health effects. Since both ozone and fine particulate matter are non-threshold pollutants for human exposure, there will be health-related benefit even in areas attaining the national ambient air quality standards.

EPA's regional haze program provides a vital and enduring framework, anchored in science and reflecting years of intergovernmental partnership, for States, Tribes and stakeholders to work toward the common goal of improving and protecting the scenic treasures of America's most precious lands.

¹⁹ Out of Sight: The Science and Economics of Visibility Impairment, Abt Associates, Inc. 2000

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Experience

Science, Technology, and Policy Consultant (Denver, CO), (2010 – present).
National Park Service (Lakewood, CO), Senior Policy Analyst (1998-2010).
Environmental Protection Agency (Research Triangle Park, NC, San Francisco, CA), Environmental Engineer (1977– 1998).

Education

MS Environmental Engineering, Duke University
BSE Civil Engineering and Public Policy, Duke University

Recent Testimony and Public Comment Before:

Arizona Corporation Commission, Colorado Air Quality Control Commission,
California Air Resources Board

Selected Publications

(with Vickie Patton) "The EPA's Regional Haze Proposal: protecting visibility in national parks and wilderness areas," Tulane Environmental Law Journal, vol. II, 1998

(with John Bachmann et al.) Review of National Ambient Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information. OAQPS Staff Paper, U.S. EPA, 1996 EPA/452/R-96/013. (NTIS, Springfield, VA PB97-115406REB)

(with Marc Pitchford) "Percent change in extinction coefficient: a proposed approach for federal visibility protection strategy," in "Visibility and Fine Particles" Conference Transactions, TR-17, A&WMA 1990

Implementation Plans for Visibility Protection- Part II, Journal of the Air Pollution Control Association, conference proceedings, paper 85-9.7, 1985

(with David Stonefield and William Hamilton) Implementing Section 126: Controlling Interstate Pollution, Journal of the Air Pollution Control Association, conference proceedings, paper 82.34.1, 1982

Chairman BRIDENSTINE. Thank you, Mr. Polkowsky.

Our next witness is Mr. Aaron Flynn, Partner at Hunton and Williams. He previously served as legal counsel for the Science Advisor to the President at the White House Office of Science and Technology Policy. Mr. Flynn, you're recognized for five minutes.

**TESTIMONY OF MR. AARON M. FLYNN
PARTNER, HUNTON & WILLIAMS LLP**

Mr. FLYNN. Thank you, and good morning. It is an honor to appear before this Subcommittee to offer testimony on EPA's Regional Haze program. As the Chairman just said, my name is Aaron Flynn. I'm a Partner in the law firm of Hunton and Williams. I've practiced environmental law as an attorney for the Congressional Research Service for the White House Office of Science and Technology Policy, and since joining Hunton and Williams in 2007, my practice has focused on the Regional Haze program.

When Congress enacted the Regional Haze provisions of the Clean Air Act, it made very clear that the states, not EPA, should make the key decisions about how to implement the program. Congress directed EPA to develop rules to guide state decision making while states were tasked with weighing the relevant information, particularly information related to compliance costs and the relative significance of visibility improvements that different controls can achieve, and then deciding which controls were justified and which demanded too much. The early decisions of the DC. Circuit acknowledged and strictly adhered to Congress's design for the program. In 2002, the court struck down EPA's first attempt at a Regional Haze rule in a case called American Corn Growers Association versus EPA because that rule unlawfully constrained state discretion to make Best Available Retrofit Technology, or BART determinations. EPA's rules would have effectively forced states to place greater weight on visibility impacts over costs or any of the other statutory BART factors, and in tossing out those rules, the DC. Circuit stated clearly that EPA could not infringe in that matter on state decision making.

When EPA promulgated replacement Regional Haze Rules in response to the Corn Growers decision, including rules affording states broad discretion to adopt alternatives to strict BART requirements, the DC. Circuit sustained those regulations against challenges that sought more restrictive policies.

EPA began to stray from a commitment to recognizing state discretion, however, when implementation of the Regional Haze program began in earnest in several early rulemakings to establish BART requirements for facilities over which EPA had direct regulatory authority and where no state had an opportunity to weigh in first the Agency established precedents for conducting BART assessment, precedents that were not necessarily clear requirements of the Clean Air Act or EPA's BART rules. Not only did those rulemakings establish questionable analytical practices, they also imposed requirements that sources install the most expensive emission controls operated to achieve the most stringent emission limits possible. That's a questionable policy in and of itself for older facilities that are undergoing emission control retrofits, as all BART-eligible facilities are.

In subsequent rulemakings, EPA went even further. While state plans that adopted EPA's policy preferences were often approved, states that chose to use their discretion differently frequently faced plan disapproval and replacement of their policy decisions with federal plans imposing strict emissions limits and expensive technology requirements.

Many states challenged the disapproval of their plans in federal circuit courts, and some of those challenges have led to successful settlements and some limited victories. The vast majority of decisions, while acknowledging the state's role in the Regional Haze program, have nevertheless accepted arguments that could be interpreted to grant EPA broad discretion to disapprove state plans. Decisions from the 8th, 9th and 10th Circuits affecting facilities in Oklahoma, North Dakota, Nebraska and Arizona have all deferred largely to EPA's judgment and granted no similar deference to state decisions.

Litigation over EPA's actions during the Regional Haze program's first planning period may be coming to a close but one case that is still in the earliest stages could set the tone for the next state of implementation. Petitions for review of EPA's Regional Haze Rule for Texas and Oklahoma have been filed in the 5th, 10th, and DC. Circuits, and whichever case—whichever court hears the case will decide a number of key questions of first impression under the program including the scope of state discretion under the Clean Air Act's Reasonable Progress provisions, which will likely be the key driver of any future regulatory requirements under the program.

The court will also be acting on one of EPA's most controversial Regional Haze Rules to date, one that would cost approximately \$2 billion more than Texas's plan while achieving no appreciable incremental visibility benefit. And DDPA's own monitors confirm that the Agency's Reasonable Progress goals for Texas are being achieved today based on emissions reductions that have already occurred, rendering EPA's plan unnecessary.

I look forward to discussing these issues further, and thank you again for the opportunity to testify today.

[The prepared statement of Mr. Flynn follows:]

**Hearing on EPA's Regional Haze Program:
Litigation During the Program's First Planning Period**

Testimony of Aaron Flynn, Partner, Hunton & Williams LLP

**U.S. House Committee on Science, Space, & Technology
Subcommittee on Environment**

March 23, 2016

Summary

When Congress enacted the regional haze provisions of the Clean Air Act, it made very clear that the states—not EPA—should make the key decisions about how to implement the program. Congress directed EPA to develop rules to guide state decision-making, while states were tasked with weighing the relevant information and then deciding which controls were justified and which demanded too much.

The early decisions of the D.C. Circuit acknowledged and strictly adhered to Congress's design for the program. EPA began to stray from a commitment to recognizing state discretion when implementation of the regional haze program began in earnest. While state plans that adopted EPA's policy preferences were often approved, states that chose to use their discretion differently frequently faced plan disapproval and replacement of their policy decisions with federal plans imposing strict emission limits and expensive technology requirements.

The courts, while acknowledging the states' role in the regional haze program, have largely deferred to EPA. Ongoing litigation over EPA's rulemaking action for Texas and Oklahoma will likely decide a number of key questions, including the scope of state discretion under the Clean Air Act's reasonable progress provisions, that will govern the next implementation period for the regional haze program.

**Hearing on EPA's Regional Haze Program:
Litigation During the Program's First Planning Period**

Testimony of Aaron Flynn, Partner, Hunton & Williams LLP

**U.S. House Committee on Science, Space, & Technology
Subcommittee on Environment**

March 23, 2016

It is an honor to appear before this Subcommittee and to offer testimony on the Clean Air Act's regional haze program. My name is Aaron Flynn, and I am a partner in the law firm of Hunton & Williams LLP. I have practiced environmental law as an attorney for the Congressional Research Service and for the White House Office of Science and Technology Policy. Since joining Hunton and Williams in 2007, my practice has focused on the regional haze program and the litigation surrounding that program. I have represented industry clients in every nationally significant rulemaking and in many of the cases involving regional haze, including litigation pending before the Fifth Circuit regarding EPA's regional haze rulemaking action for Texas and Oklahoma and before the D.C. Circuit regarding whether EPA may allow electric generating companies to rely on the Cross-State Air Pollution Rule, or CSAPR, to satisfy the Clean Air Act's regional haze requirements. I am not, however, representing anyone with regard to this testimony. I am testifying in my own personal capacity as a Clean Air Act practitioner who focuses on EPA's visibility program.

Background

Congress enacted section 169A of the Clean Air Act as part of the 1977 amendments to the Clean Air Act, and, in doing so, established a national goal of preventing any future, and remedying any existing, visibility impairment in mandatory Class I federal areas that is caused by manmade air pollution. In particular, that provision of the Act targeted visibility impairment

caused by geographically dispersed sources of air pollution or, in other words, regional haze. 42 U.S.C. § 7491(a)(1). The Act directs EPA to issue regulations designed “to assure ... reasonable progress toward meeting the national goal” and to require each state to submit a state implementation plan (“SIP”) containing “such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal.” *Id.* § 169A(a)(4), (b)(2). A regional haze SIP has three main elements: (1) reasonable progress goals, which are visibility goals for each mandatory Class I federal area (certain national parks and wilderness areas) located in the state; (2) a long-term strategy, which is the state’s plan for meeting the reasonable progress goals; and (3) “best available retrofit technology” (or “BART”) requirements for certain large stationary sources.

EPA’s regional haze rule states that for each Class I area in a state, the state “must establish goals (expressed in deciviews⁽¹⁾) that provide for reasonable progress towards achieving natural visibility conditions.” 40 C.F.R. § 51.308(d)(1). The rules further require that a reasonable progress goal “provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period.” *Id.* To establish a reasonable progress goal, a state must conduct an assessment of four factors: “[1] the costs of compliance, [2] the time necessary for compliance, [3] the energy and non-air quality environmental impacts of compliance, and [4] the remaining useful life of any potentially affected sources.” *Id.* § 51.308(d)(1)(i)(A). The rules further require states to “include a demonstration showing how these factors were taken into consideration in selecting the goal.” *Id.* In addition, in setting its reasonable progress goals, a

¹ A deciview is a “haze index derived from calculated light extinction, such that uniform changes in haziness correspond to uniform incremental changes in perception across the entire range of conditions, from pristine to highly impaired.” 40 C.F.R. § 51.301.

state must determine and take into account what EPA refers to as the “uniform rate of progress” that would be needed to attain natural visibility conditions by the year 2064. *Id.*

§ 51.308(d)(1)(i)(B). A state may establish reasonable progress goals that differ from the uniform rate of progress if the state demonstrates that the uniform rate for the Class I area in question would not be reasonable. *Id.* § 51.308(d)(1)(ii). A state makes such a showing by conducting a reasonable progress analysis that considers the four reasonable progress factors. *Id.* Finally, states whose emissions may cause visibility impairment in another state’s Class I area, and states with Class I areas that may experience visibility impairment caused by emissions from other states, may be subject to an interstate-consultation requirement. *Id.* § 51.308(d)(1)(iv). The purpose of that requirement is to provide a forum for states to decide collaboratively on reasonable emission reductions and appropriate apportionment of responsibility for reducing emissions during each planning period of the regional haze program.

In connection with establishment of reasonable progress goals, EPA’s rules also direct each state to submit a long-term strategy to address regional haze in its Class I areas and the Class I areas in other states that are affected by emissions from the state. *Id.* § 51.308(d)(3). That strategy “must include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.” *Id.* As in the setting of reasonable progress goals, states must consult with one another when emissions from one state impact Class I areas in other states, and a state that causes or contributes to visibility impairment in a Class I area in another state must “demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area.” *Id.* § 51.308(d)(3)(ii). The rules also require states to document the modeling they rely on and

specifically allow states to rely on modeling conducted by the regional planning organizations (“RPOs”) provided for in the Clean Air Act. *Id.* § 51.308(d)(3)(iii).

The regional haze rule also specifies requirements for BART. States determine and require BART for “BART-eligible” sources that are “subject to BART” for the purpose of controlling emissions that impair visibility in Class I areas. BART-eligible sources are, generally, individual stationary sources that emit sizable amounts of visibility-impairing pollutants, that are within certain statutorily specified source categories (including fossil-fuel fired steam electric generating units, or “EGUs,” of a certain size), and that were in existence on August 7, 1977, but had not been in operation for more than 15 years as of that date. 42 U.S.C. § 7491(b)(2)(A); 40 C.F.R. § 51.301 (defining “existing stationary facility”); *see generally* 70 Fed. Reg. 39,104 (July 6, 2005) (promulgating BART rules). A BART-eligible source is “subject to BART” if, based on an analysis of visibility impacts, it “may reasonably be anticipated to cause or contribute to any impairment of visibility in any mandatory Class I Federal area.” 40 C.F.R. § 51.308(e)(1)(ii).

Determining BART for a specific eligible source generally requires consideration of five factors as they apply to that source: (1) the costs of compliance, (2) the energy and non-air quality environmental impacts of compliance, (3) any existing pollution control technology in use at the source, (4) the remaining useful life of the source, and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. 42 U.S.C. § 7491(g)(2); *see also* 40 C.F.R. § 51.301 (definition of BART). EPA’s BART rules also permit states, instead of requiring a source to install, operate, and maintain BART, to establish a “BART alternative” that would “achieve greater reasonable progress than would be achieved through the installation and operation of BART.” *Id.* § 51.308(e)(2). The emission reductions

necessary for a BART alternative to achieve greater reasonable progress than would be achieved through BART must be surplus to the emission reductions resulting from measures adopted to meet requirements of the Clean Air Act as of the SIP's baseline date. *Id.* § 51.308(e)(2)(iv). The BART rules provide three alternative tests for determining whether a given BART alternative achieves greater reasonable progress than BART would. Pursuant to 40 C.F.R. § 51.308(e)(2)(i)(E), a state may establish a BART alternative “based on the clear weight of evidence that the trading program or other alternative measure achieves greater reasonable progress than would be achieved through the installation and operation of BART at the covered sources.” The BART rules also allow a state to establish a BART alternative pursuant to specific criteria stated in 40 C.F.R. § 51.308(e)(3). Under that provision, a state may demonstrate that either (1) “the distribution of emissions [under the BART alternative] is not substantially different than under BART, and the alternative measure results in greater emission reductions” than BART would, or (2) “the distribution of emissions is significantly different” but air quality dispersion modeling shows that for the worst and best 20 percent of days for the affected Class I areas,

(i) Visibility does not decline in any Class I area, and

(ii) There is an overall improvement in visibility, determined by comparing the average differences between BART and the alternative over all affected Class I areas.

Id. § 51.308(e)(3).

In two separate rulemakings, EPA itself identified two BART alternatives based on EPA regulations promulgated under other sections of the Clean Air Act that states subject to those programs could rely on to satisfy BART obligations for NO_x and SO₂ emissions. First, EPA determined that compliance with the Clean Air Interstate Rule (“CAIR”) could satisfy electric generating units’ NO_x and SO₂ BART requirements, the so-called “CAIR=BART rule.”

Subsequently, when EPA replaced CAIR with the Cross-State Air Pollution Rule (“CSAPR”), EPA promulgated a rule finding that compliance with that program would satisfy NO_x and SO₂ BART requirements, i.e. the “CSAPR=BART rule”. States and EPA have also promulgated BART alternatives for individual power plants.

Early Court Decisions Emphasized State Authority

EPA promulgated its first rule to implement the regional haze program in 1999, prompting the first legal challenge to the program in *American Corn Growers Association v. EPA*, 291 F.3d 1 (D.C. Cir. 2002). One of the primary issues in that case concerned provisions of EPA’s 1999 rule governing the manner in which states assess BART requirements for facilities, like electric generating units, that are determined to affect visibility conditions in national parks and wilderness areas. As noted above, the Clean Air Act requires states to consider and weigh five factors when determining the type of emission controls that constitute BART for a particular facility: “the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.” 42 U.S.C. § 7491(g). EPA’s 1999 BART rule would have effectively forced states to place the greatest weight on one factor—the degree of visibility improvement—by requiring states to assess aggregate visibility impacts from all BART sources rather than from individual sources. The D.C. Circuit struck down that provision of the rule, finding that Congress had not authorized EPA to limit state discretion to implement the regional haze program in that manner. Indeed, the court used expansive language when describing the role of the states with respect to regional haze, holding that states “play the lead in designing and implementing regional haze programs,” that “Congress

directed states to make” the judgment as to how to weigh the BART factors, and that the 1999 regional haze rule was ultimately “inconsistent with the Act’s provisions giving the states broad authority over BART determinations.” *Id.* at 2, 6, 8. In particular, the Court relied on the legislative history of the 1977 Clean Air Act Amendments, see H.R. Conf. Rep. No. 96-564 (1977), U.S.C.C.A.N. 1977 at 1502, 1536, as “confirm[ing] that Congress intended the states” and not EPA “to decide which sources impair visibility and what BART controls should apply to those sources.” *Corn Growers*, 291 F.3d at 8. The court further explained that EPA’s interpretation of the Clean Air Act’s regional haze provisions was flawed because “[u]nder EPA’s take on the statute, it is . . . entirely possible that a source may be forced to spend millions of dollars for new technology that will have no appreciable effect on the haze in any Class I area.” *Id.* at 7.

EPA adopted new regional haze rules responding to the D.C. Circuit’s decision in *Corn Growers* in 2005. 70 Fed. Reg. 39104 (July 6, 2005). EPA also promulgated “BART Guidelines” and the CAIR=BART rule, described above. The 2005 rules and the BART Guidelines, including the CAIR=BART rule, were also challenged in the D.C. Circuit. Most significantly, in *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir. 2006), the D.C. Circuit again affirmed state discretion to develop alternatives to BART, so long as those alternatives achieve greater reasonable progress than BART would, providing states with the flexibility to adopt regulatory mechanisms, such as an emissions trading program, that would not necessarily be legally permissible as a BART requirement but that could achieve visibility improvement more cost-effectively. *See also Ctr. For Energy and Econ. Dev. v. EPA*, 398 F.3d 653 (D.C. Cir. 2005) (also validating the concept of BART alternatives). The D.C. Circuit also approved the CAIR=BART rule as a valid alternative to BART.

Litigation Concerning Regional Haze Plans

After these decisions addressing the validity of the broader rules governing the regional haze program, the states and EPA turned their attention to implementing these visibility requirements. The RPOs undertook substantial technical work to model visibility conditions throughout the nation and to assess impacts attributable to emissions from various sources. Often relying to a significant extent on the technical work of the RPOs, states began assessing reasonable progress, BART, and often BART alternatives, as appropriate for the sources located within their borders. The deadline for submitting regional haze SIPs to EPA for review was December 17, 2007. On January 15, 2009, EPA issued a finding that 37 states, plus the District of Columbia and the U.S. Virgin Islands, had failed to submit regional haze SIPs. Although many states submitted regional haze SIPs after the 2009 finding of failure, EPA generally did not take further action by the applicable legal deadlines either to promulgate federal implementation plans ("FIPs") or to act on those SIPs, prompting environmental groups to sue the Agency pursuant to section 304 of the Clean Air Act to obtain a court order setting new deadlines for EPA action. That litigation eventually resulted in a consent decree establishing those deadlines.

Once EPA began to act on the regional haze plans for specific states, a relatively clear pattern emerged. Where EPA had direct regulatory authority over specific facilities, including electric generating units located on tribal lands, the Agency tended in many cases to opt for the most stringent emission control technologies available—scrubbers in the case of SO₂ and selective catalytic reduction, or SCR, technology for NO_x emissions, despite information in the record suggesting that the costs of these requirements were not justified by the benefits. States that made similar BART determinations for their electric generating units frequently had their SIPs approved. States that concluded, after applying the five BART factors, that less stringent

and expensive controls were BART, however, received greater scrutiny of their SIPs, and many of those determinations were rejected by EPA, which then went on to impose its own regional haze federal implementation plans or FIPs requiring the more stringent control technologies.

A number of states whose BART SIPs were disapproved, along with their affected facilities, filed petitions for review challenging those SIP disapprovals and EPA's promulgation of FIPs. Some of those challenges, like cases filed in October 2011 challenging a regional haze FIP for New Mexico, have not resulted in decisions from the federal courts but have instead been resolved or are in the process of being resolved through new regional haze rulemakings containing requirements that the parties to these cases have determined are acceptable.

The decisions that have been rendered, while acknowledging a role for states, have been interpreted as allowed EPA to minimize state discretion and in some cases appear to grant EPA the primary policy-making role. The first such decision came in 2013 from the Tenth Circuit in *Oklahoma v. EPA*, 723 F.3d 1201 (10th Cir. 2013). That case involved SO₂ BART limits for four Oklahoma electric generating units located at the Muskogee Generating Station and the Sooner Generating Station. Oklahoma's regional haze SIP established a 0.65 lb/MMBtu 30-day average SO₂ emission limit and a 0.55 lb/MMBtu annual average SO₂ emission limit for these units based on continued use of low-sulfur coal. After applying the BART factors, the state rejected emission limits based on more stringent scrubber controls as unjustified given the significant costs and minimal visibility benefits. EPA contended that Oklahoma had misjudged the costs of installing scrubbers and on that basis promulgated a FIP requiring these Oklahoma units to achieve a 0.06 lb/MMBtu SO₂ emission rate. The state and industry petitioners requested that the Tenth Circuit stay EPA's regional haze rule for Oklahoma pending judicial review, and a two-judge panel of the court granted that request. Ultimately, however, a different

panel of judges concluded that EPA had authority to review Oklahoma's SIP for compliance with the Clean Air Act and EPA's regulations. Further, the court held that EPA had properly exercised its authority to disapprove the SIP's SO₂ BART determinations for the Muskogee and Sooner plants, accepting EPA's finding that Oklahoma's consideration of the BART cost factor was inconsistent with the BART Guidelines and that the information on site-specific costs Oklahoma provided was not adequately documented. The court did not explicitly address whether the BART Guidelines actually require cost calculations to be made in the manner in which EPA preferred, even though there are strong arguments that the Guidelines do not impose a requirement to adhere to any particular costing methodology. And the court's decision did not clarify what level of cost documentation would be sufficient. The analysis EPA used to support the policy decisions contained in its FIP for Oklahoma—despite an acknowledgement from the court that “this is a close case”—received substantial deference from the Tenth Circuit.

Shortly after the Tenth Circuit's ruling in the Oklahoma case, in September 2013 the Eighth Circuit issued its decision in *North Dakota v. EPA*, 730 F.3d 750 (8th Cir. 2013). There, the state and Great River Energy challenged EPA's disapproval of North Dakota's BART determination for the Coal Creek Station. That determination required the facility to meet a 0.17 lb/MMBtu NO_x emission limit based on use of combustion controls, rather than the more expensive SCR or selective non-catalytic reduction (“SNCR”). EPA replaced that determination with an emission limit of 0.13 lb/MMBtu based on use of costly SNCR controls. The court upheld EPA's decision to disapprove the SIP because the BART determination had been based on an admitted and substantial error in the cost calculations. The court, however, also rejected EPA's FIP for Coal Creek Station in North Dakota, because EPA had refused to consider the emission control technology already in place at Coal Creek Station, a clear violation of the Clean

Air Act, which lists consideration of such controls as one of the BART factors. Given the relatively clear errors, these elements of the court's decision were not surprising. The state's challenge to EPA's disapproval of its reasonable progress determination for the Antelope Valley Station, however, reflected substantial deference to EPA decision-making. With respect to EPA's reasonable progress determination for that plant, the court accepted EPA's finding that it was unreasonable for North Dakota to rely on a cumulative source visibility model rather than a single source visibility model, even though neither the Clean Air Act nor EPA's rules expressly prohibit use of such a model.

Another significant decision involving these issues was issued by the Ninth Circuit on June 9, 2015, in *National Parks Conservation Association v. EPA*, 788 F.3d 1134 (9th Cir. 2015). That case involved challenges to an EPA FIP for the state of Montana by PPL Montana, the operator and partial owner of two electric generating facilities, the Colstrip and Corette power plants, affected by the FIP, and by several environmental groups. Unlike Oklahoma and North Dakota, Montana opted not to submit a regional haze SIP to EPA. Accordingly, this case does not speak directly to the relative roles of the states and the federal government under the regional haze program. It does, however, speak to the limits of EPA's discretion when the Agency determines BART. The Ninth Circuit held that EPA had failed to justify its NO_x and SO₂ BART determinations for Colstrip Units 1 and 2 because EPA had simply asserted that such limits were cost-effective and justified without providing any further explanation. The court reached a similar conclusion with respect to EPA's limited explanation for its BART determinations for Corette, but also found that the costs and visibility impacts associated with emission controls that EPA rejected for Corette were nearly identical to those that EPA found sufficient to justify limits for Colstrip. Because these outcomes appeared inconsistent and EPA

provided no explanation for that inconsistency, the court determined the BART FIP was unlawful. Finally, the court concluded that EPA's FIP was fatally flawed because EPA failed to respond to PPL Montana's argument that the visibility impacts EPA projected were so small they were within the margin of error of the model EPA used and that installation of BART could not, therefore, be reasonably anticipated to result in visibility improvements.

The next case to be decided was *Nebraska v. EPA*, 812 F.3d 662 (8th Cir. 2016). That case involved EPA's partial disapproval of Nebraska's regional haze SIP and its SO₂ BART determination for the Gerald Gentleman Station. Nebraska had determined that SO₂ scrubbers and dry sorbent injection control technology would have been unreasonably costly in relation to the visibility improvement such controls were projected to produce and that no additional controls constituted SO₂ BART. Specifically, Nebraska found the expense associated with obtaining water needed to operate the scrubbers would have pushed the costs of scrubber technology unreasonably high. EPA disagreed, finding that the costs were reasonable and the visibility impacts were significant. EPA also concluded that Nebraska had overestimated some costs and underestimated visibility benefits. The Eighth Circuit held that EPA properly executed its statutory role in determining that Nebraska's rationale was unreasonable, and it deferred to EPA's decision to disapprove the SIP.

EPA promulgated a FIP for Nebraska to replace the state's SO₂ BART determination for the Gerald Gentleman Station. That FIP relied on the CSAPR=BART rule to satisfy that facility's SO₂ BART obligations and was challenged by environmental groups. The court upheld EPA's application of the CSAPR=BART rule. Litigation addressing that rule is discussed further below.

On February 24, 2016, the Ninth Circuit issued its opinion in *Arizona ex rel. Darwin v. EPA*, --- F.3d ---, 2016 WL 722685 (9th Cir. 2016), in which Arizona and the Salt River Project Agricultural Improvement and Power District challenged EPA's disapproval of Arizona's regional haze SIP and promulgation of a FIP for the Coronado Generating Station. (Arizona's SIP included BART determinations for three Arizona power plants, although two of those plants, over the course of the Arizona BART litigation, were able to negotiate new BART SIP provisions that have settled, or may soon settle, disputed issues raised as to those power plants.) Once again, EPA disapproved state NO_x BART determinations because the Agency disagreed with the manner in which the state evaluated costs and visibility impacts. As a result, it promulgated a FIP imposing emission limits based on installation and operation of SCR controls plus low-NO_x burners, represented by a facility-wide average NO_x limit of 0.065 lb/MMBtu for Coronado. The Ninth Circuit, in one of the most extensive judicial discussions of the state and federal roles under the regional haze program to date, made clear that, although the statute grants substantial leeway to states in making BART determinations, the court will often defer to EPA judgments about whether the state decisions are reasonable. Having articulated that standard of judicial review, the court affirmed EPA's disapproval of the Arizona SIP. As seen in other cases, the court accepted EPA's assertion that the SIP's cost estimates were insufficiently documented and it accepted EPA's conclusion that the state had inadequately evaluated visibility impacts on a cumulative and most-impacted Class I area basis, despite strong evidence that the state had effectively considered both. The Ninth Circuit also, in large part, rejected the challenge to EPA's FIP for Arizona, deferring to EPA's decision to use a cumulative approach to evaluate visibility impacts and rejecting arguments that EPA underestimated costs and failed to reasonably consider the presumptive BART limits contained in its own BART Guidelines.

The outcome of these cases suggests that Congress's intent that states be empowered to make BART determinations, and the policy decisions associated with ensuring reasonable progress toward the national visibility goal, has been frustrated for a number of states. Instead, EPA has effectively established a more uniform national policy on regional haze requirements, and states that attempt to deviate from those policy choices often are subjected to regional haze FIPs. Although the courts generally have acknowledged that states have an important role under the regional haze program, in several decisions to date, courts have largely been unwilling to ensure state primacy.

In addition to the decisions described above, a number of additional cases remain pending in the federal courts. Litigation addressing EPA's CSAPR=BART rule is the subject of cases that are now being held in abeyance in the Fourth and Sixth Circuits, as well as in cases before the D.C. Circuit that are now at the very earliest stages of proceedings. The Third Circuit and the Eighth Circuit were also presented with cases addressing the CSAPR=BART rule. Rather than hold those cases in abeyance, as other courts did, pending resolution of the litigation involving CSAPR, those courts decided those cases. In *Nebraska v. EPA*, 812 F.3d 662 (8th Cir. 2016), as stated above, the Eighth Circuit held that EPA properly relied on its CSAPR=BART rule in promulgating a FIP for the Gerald Gentleman Station in Nebraska. In *National Parks Conservation Association v. EPA*, --- F.3d ---, 2016 WL 94598 (8th Cir. 2016), that court similarly held that EPA had properly approved a Minnesota regional haze SIP that relied on the CSAPR=BART rule. The Third Circuit, on the other hand, determined that jurisdiction to hear cases related to the CSAPR=BART rule rests exclusively with the D.C. Circuit. *National Parks Conservation Association v. EPA*, 803 F.3d 151 (3d Cir. 2015). The outcome of the

CSAPR=BART rule litigation in the D.C. Circuit could have significant implications with respect to states' ability to rely on BART alternatives as EPA has provided in its regulations.

A number of additional regional haze cases remain pending in the federal courts. Perhaps the most significant of those cases is litigation over EPA's final regional haze rule for Texas and Oklahoma. In a final rule published on January 5, 2016, EPA took a number of unprecedented actions in its partial approval and partial disapproval of Texas and Oklahoma's regional haze SIPs. 81 Fed. Reg. 296 (Jan. 5, 2016). Of particular significance, EPA disapproved the reasonable progress goals for two Class I areas in Texas and one Class I area in Oklahoma based on its conclusion that Texas sources could achieve more emission reductions than Texas required in its SIP. EPA took that action despite the considerable deference that the Clean Air Act and the Agency's own guidance grants to states when making reasonable progress determinations.

EPA's disapproval of the reasonable progress goals was also based, in part, on EPA's conclusion that Texas and Oklahoma had not engaged in sufficient interstate consultation and that Oklahoma, in particular, had improperly failed to gain Texas's agreement to sufficient emission reductions at Texas power plants to achieve reasonable progress in the Class I area located in Oklahoma. EPA had never before disapproved a regional haze SIP due to what it views as inadequate interstate consultation. In conjunction with its SIP disapprovals, EPA promulgated regional haze FIPs for Texas and Oklahoma. Those FIPs include revised reasonable progress goals and new SO₂ limits for 15 electric generating units in Texas. EPA imposed these SO₂ limits under the Clean Air Act's reasonable progress provisions, not the Act's BART requirements, on which EPA has temporarily deferred action for Texas. Again, such an approach is unlike EPA's action for other states, and it is inconsistent with EPA's reasonable progress guidance, which states that BART is likely to satisfy all reasonable progress

requirements for the first planning period of the program. Further, EPA rejected Texas and Oklahoma's reliance on analyses conducted by the regional planning organization for those states. EPA also imposed reasonable progress requirements that it acknowledges cannot be achieved by the end of the first regional haze planning period in 2018, thereby interfering with Texas's ability to evaluate requirements for the second planning period, which extends from 2019 to 2028. Moreover, EPA's FIP has been estimated to cost approximately \$2 billion more than Texas's regional haze SIP and is projected by EPA to achieve additional visibility benefits that are not humanly perceptible and are indeed only fractions of a deciview. Further, emission reductions already achieved through implementation of existing requirements have resulted in monitored visibility conditions in the affected Class I areas that satisfy the goals set forth in EPA's plan.

Petitions for review of the Texas and Oklahoma regional haze rule have been filed in the Fifth, Tenth, and D.C. Circuits. The State of Texas and the Texas utilities that are regulated by EPA's rule have filed motions to stay the rule while the litigation is pending. EPA is due to respond to those motions on March 31, 2016. How the stay motions and the litigation itself are resolved could have significant implications not only for Texas sources and the State of Texas in the near term but also for implementation of the regional haze program during the second planning period.

Conclusion

Congress made clear when it enacted section 169A of the Clean Air Act in 1977 that it intended states to be the primary decision-makers as to how the regional haze program should be implemented and how the national goal of eliminating manmade visibility impairment in Class I areas should be achieved. The D.C. Circuit recognized that fact in the earliest litigation

concerning rules to implement the program. On their face, EPA's rules and the BART Guidelines leave states with substantial discretion to devise regional haze implementation plans. Since EPA began its efforts to review regional haze SIPs, however, it has become clear that the Agency has specific emission control policy preferences. EPA has been able to impose those preferences by interpreting its BART rules to impose strict requirements—many would argue improperly—and the courts often have deferred to EPA in this respect. Congress intended states to have much more flexibility under the regional haze program than EPA and some court decisions have recently recognized. If Congress's intent is to be realized, there must be a substantial change in policy from the Executive Branch or corrective actions by Congress.

Thank you again for the opportunity to testify today.

**PRACTICES**

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Aaron's practice focuses on environmental and administrative law, with an emphasis on regulation of visibility impairment, climate change, and national air quality under the Clean Air Act.

Aaron represents clients in regulatory matters before the US Environmental Protection Agency and the White House and in litigation before the federal appellate and district courts. Aaron has represented utilities and trade associations in nearly every significant regulatory and litigation proceeding involving EPA's regional haze program. His climate change practice has addressed each element of EPA's program to regulate greenhouse gas emissions, including its controversial Clean Power Plan. Aaron also oversees the firm's practice with respect to the National Ambient Air Quality Standards for environmental protection and has led industry's regulatory and litigation response to those policies.

Aaron has extensive government and policy experience from his previous roles as a legal advisor to the US Congress and a lawyer for the White House on environmental and natural resources law and science policy. His representative clients include electric generating utilities and other major companies and trade associations in the energy, mining and transportation industries.

Aaron is admitted to practice before the US Supreme Court and the US Courts of Appeals for the Third, Fourth, Fifth, Sixth, Eighth, Ninth, Tenth, and DC Circuits. He is also admitted to the US District Court for the District of Columbia.

Relevant Experience

Regional Haze. Aaron has extensive experience with EPA's Regional Haze Program. He has represented clients in rulemaking proceedings related to visibility regulation for nearly every state. Most significantly, he has represented four western utilities in major challenges to EPA's visibility rules in the Ninth and Tenth Circuit courts. For utilities in the eastern part of the country, Aaron is defending regulations that allow the utility industry to rely on compliance with the Cross-State Air Pollution Rule to satisfy regional haze requirements in proceedings before the Fourth, Sixth, and DC Circuits. In addition, he advises clients on what to expect during the Regional Haze Program's second implementation period, which extends from 2018 to 2028 and is likely to apply the program to new industries.

- **National Ambient Air Quality Standards (NAAQS).** Aaron has represented the utility industry before EPA in every NAAQS revision proceeding since joining Hunton & Williams LLP in 2007. He represents clients before the DC Circuit and the Supreme Court in litigation related to the standards. In particular, Aaron has led industry efforts challenging the establishment of new secondary NAAQS. Most significantly, in the DC Circuit, Aaron helped to successfully defend EPA's decision not to set unprecedented standards for nitrogen and sulfur oxides to protect water bodies. Similarly, representing clients before EPA and the White House Office of Management and Budget, Aaron helped to protect his clients from becoming subject to secondary standards for particulate matter and ozone.
- **Climate Change.** Aaron's climate change practice for the firm began with his representation of industry in EPA's Endangerment Finding proceedings. In that role, Aaron was instrumental in developing the consensus industry position on how to address climate change science. Since that time, Aaron has been involved in each of EPA's rulemaking proceedings involving greenhouse gas regulations, including its controversial Clean Power Plan for existing electric generating facilities. In particular, Aaron advises clients on how states can develop plans to comply with the Clean Power Plan and advises on how those plans might be defended against EPA disapproval. Similarly, Aaron advises clients regarding compliance with state and regional greenhouse gas regulatory programs, such as the Regional Greenhouse Gas Initiative in the Northeast and AB 32 in California.
- **Fuels and Fuel Producers.** Aaron's practice also focuses on EPA's fuel regulations. He has represented industry in litigation in the DC Circuit related to EPA's waiver for fuel ethanol content and related misfueling standards (*Alliance of Auto. Manufacturers, et al. v. EPA*) and in litigation related to EPA's new source performance standards (NSPS) and hazardous air pollutant (HAP) regulations for oil and gas producers (*Delaware Department of Natural Resources v. EPA*, and *American Petroleum Institute v. EPA*).
- **White House Experience.** Prior to joining Hunton & Williams LLP Aaron worked as a lawyer for the White House Office of Science and Technology Policy (OSTP), from 2006 to 2007, where he served as legal counsel for the Science Advisor to the President of the United States. At OSTP, Aaron was responsible for climate change issues, issues related to the major environmental statutes, and a broad range of matters related to the intersection of science and the law. In particular, Aaron sat on the White House's Ag-Biotech Working Group, which coordinates regulation of genetically modified organisms by EPA, the Food and Drug Administration, and the Department of Agriculture. He also represented OSTP in numerous regulatory review meetings conducted by the Office of Management and Budget and in meetings of the Committee for Foreign Investment in the United States (CFIUS).
- **Congressional Experience.** From 2003 to 2006, Aaron served as a legal advisor to the members and committees of the US Congress,

working as a legislative attorney for the Congressional Research Service. In that role, Aaron served as Congress' nonpartisan legal authority on all matters related to environmental and energy law. Working with individual congressional offices and committee staff, Aaron assisted in the development of numerous pieces of legislation, including the Energy Policy Act of 2005, and was recognized for his work on climate change, liquefied natural gas (LNG) regulation, public lands policy, military base closure and property redevelopment (BRAC), and offshore and onshore oil, gas, and renewables development.

Publications

- Co-author, *Before the Dust Can Settle, New Ozone Standards*, Air & Waste Management Association's *EM Magazine*, May 2015
- Co-author, *Litigating Regional Haze: Answers—and Questions—from the Most Recent Court Decisions*, Air & Waste Management Association's *EM Magazine*, May 2014
- Appellate Court Tells EPA to Think Again about Ambient Standards for Particulate Matter, *EM Magazine*, May 2009

Events

- Insights into EPA: Special Sessions with EPA Officials, Hunton & Williams LLP, Washington DC, November 3, 2015
- Speaker, EPA's Clean Power Plan: Latest Developments, Infocastevents Webinar, March 3, 2015
- Speaker, EPA's Greenhouse Gas Regulations, 2014 North Carolina Environmental, Energy, Health & Safety (EEHS) School, Raleigh, North Carolina, August 26, 2014
- Speaker, The Regional Haze Program, Implementation During the First Planning Period and What Comes Next, Seventeenth Annual Energy, Utility & Environment Conference, Phoenix, Arizona, February 4, 2014
- Speaker (with Norman Fichthorn), EPA's Regional Haze Program: A New Agenda for Visibility, Sixteenth Annual Energy, Utility & Environment Conference, Phoenix, Arizona, January 30, 2013
- Speaker, Setting Secondary NAAQS to Protect the Environment, Environmental Law Institute, June 13, 2012

Chairman BRIDENSTINE. I thank the witnesses for their testimony. Members are reminded that Committee rules limit questioning to five minutes. The Chair recognizes himself for five minutes.

Mr. Flynn, is the Regional Haze program intended to protect public health?

Mr. FLYNN. Thank you for the question, Chairman. It categorically is not intended to protect public health.

Chairman BRIDENSTINE. Can you explain how this makes this rule different from the National Ambient Air Quality Standards?

Mr. FLYNN. Absolutely. The Regional Haze Rule is aimed entirely at protecting visibility conditions. Section 169(a) of the Clean Air Act establishes a national goal that Congress set of achieving visibility conditions in what are called Class I Federal Areas, essentially National Parks and wilderness areas, large ones, that is unimpaired by manmade air pollution. That national goal is phased in over a long period of time, a decades-long expanse of time. EPA has set a target goal for achieving the national goal of 2064. Even that date is not written into the statute, and it's simply a part of EPA's regulations, and EPA's regulations provide for the fact that states are free to determine whether the glide path to get to unimpaired visibility by 2064 is in fact reasonable. If it's not reasonable, states are free to push that deadline back even further.

Chairman BRIDENSTINE. Let me ask you on that. Did Congress intend the Regional Haze program to be used by the EPA to mandate specific controls at specific power plants? Was that the intent?

Mr. FLYNN. Congress certainly provided for the BART provisions, which envision states looking at and deciding whether specific controls are justified for a specific facility.

Chairman BRIDENSTINE. But that would be up to the states, right?

Mr. FLYNN. Exactly right, sir, and it is also—certainly there was no—there's nothing in the Clean Air Act that suggests that specific controls for specific classes of facilities are mandated by the Regional Haze program. It is very much a process of weighing various factors, a process that is imbued with a vast amount of discretion in order to determine whether controls are justified at all and what controls those might be, and as you said, those decisions are intended to be made by the states.

Chairman BRIDENSTINE. Okay. Thank you.

Mr. Yeatman, would you agree that EPA's visibility goals at the heart of the Regional Haze regulations have already been achieved. Based on the pictures you showed up and compared to some of the pictures we saw before that, it would appear that most of these goals have already been achieved. Would you agree with that?

Mr. YEATMAN. Thank you very much for the question. Indeed, I would agree that as Congress envisioned and as EPA envisioned, because this is an aesthetic regulation and not a public health regulation, that states could very well achieve the goals of this program through implementation of the Clean Air Act's public health rules. I mean, remember, the Clean Air Act is a ratcheting mechanism. Every eight years the New Source Performance Standards for each source category must be reviewed and updated. Every eight years Hazardous Air Pollutant Standards for each source category

must be updated. So the very nature of the Clean Air Act is to get more stringent with time. It is as such reasonable to depend on these ever-more stringent public health controls to achieve these not public health, these aesthetic goals.

Very briefly, if I might just touch upon the matter of the Federal Implementation Plans that was brought up by my fellow witness, indeed, I would note I was under the impression it was 26 as opposed to 35, but that is neither here nor there. We can definitely get the official number in the record. I note only that all FIPs are not created equal. As I understand it, and as was explained in the testimony of my fellow witness, Mr. Polkowsky, the science wasn't there to implement Regional Haze Rules for regional haze as opposed to individual plumes until the late 1990s. The upshot is, there weren't costs attendant to those FIPs. I mean, correct me if I'm wrong, Mr. Polkowsky, but I'm under the impression there were controls at the Four Corners power plant that first round but I don't know of any others. The upshot being, there certainly weren't \$5 billion worth of costs imposed by the federal government on unwilling states. So I think that's a difference that should be noted.

Chairman BRIDENSTINE. In my few remaining seconds, at this time, Mr. Yeatman, are additional and more stringent Regional Haze regulations necessary?

Mr. YEATMAN. Oh, it's for each state to determine. That's for states to determine how much they value an aesthetic improvement.

Chairman BRIDENSTINE. Okay. My time is expired.

I now recognize the Ranking Member, Ms. Bonamici, for five minutes.

Ms. BONAMICI. Thank you very much, Mr. Chairman, and thank you to our witnesses for all your testimony and expertise.

I basically want to focus on economic issues, but Mr. Polkowsky, you state in your written testimony in your conclusion that it's important to recognize that any pollution control required for protection of visibility will have collateral benefits for public health by reducing human exposure to fine particulate matter, and that is also spelled out with more detail in the letter that we submitted for the record from the National Parks Conservation Association because we are talking about the same pollutants that contribute to visibility impairment, harming public health when we're talking about respiratory disease, decreased lung function, asthma attacks.

So could you just briefly comment on that aspect as well? Even though yes, this rule was—the goal is for visibility but there are—you know, we often think about unintended consequences of legislation. These happen to be positive consequences that aren't necessarily what was the goal of the legislation.

Mr. POLKOWSKY. Yes, you're absolutely correct in that when you control for visibility to aim at a certain target like a BART determination as we did in Arizona in the mid-1980s—sorry, in the early 1990s, there were certainly benefits to exposure on tribal lands and nearby communities. So those exposures reduce—those pollutants being reduced, sulfur dioxide in that case, is going to contribute to lower sulfate levels, which will improve visibility. It will also mean less sulfate to be inhaled and less health impacts for the commu-

nities that are exposed, and that's true for implementing maximal improved visibility if it reduces levels of fine particles. It works both ways, and—

Ms. BONAMICI. Thank you. And I'm going to ask you, in your testimony you talk about the long-term surveys that the National Park Service has conducted of park visitors, and you mentioned the value that visitors ascribe to clean air and scenic views, and you state that the protection of visibility in our most treasured parks and wilderness areas drives economic progress in those regions and nationally.

So can you talk about—you did in your testimony, but expand on the economic effect of haze and how does that impact a visitor's experience and the economy of the local region?

Mr. POLKOWSKY. Well, as you already noted, one of the key factors is that as visibility improves, people actually spend more time at the parks, and that's very important because when they spend more time, they spend more money, and as our Clean Air Task Force report in 2000 looked at, you know, can we actually link improving—reducing emissions from power plants across mainly the eastern sector. This is before the full wave of controls that is sort of well underway in the east. Would that actually result in economic benefit across all these communities and more jobs, and the answer was yes.

Ms. BONAMICI. And I do want to get in another question in my remaining time.

Mr. Polkowsky, the testimony of some witnesses seems to suggest that the EPA should sort of rubber-stamp the state's implementation plan, and I don't think anyone here is suggesting that, so could you talk about the oversight role of the EPA in implementing the Regional Haze program and whether it's appropriate for the EPA to evaluate the state's implementation plan to ensure that the requirements of the program are being met?

Mr. POLKOWSKY. It's, you know, a sort of required role of the Clean Air Act for EPA to have oversight on all State Implementation Plans for whatever program is being implemented, and in this case, as I mentioned in my oral testimony, we're dealing with the formation and transport over long, long ranges, hundreds of miles, and so coordinating the state plan, for instance, perhaps in Texas with what the goals that were set in Arkansas for Caney Creek Wilderness is important. That's an important function to make sure that Arkansas is going to get what it's counting on in terms of emissions reductions from another state.

Ms. BONAMICI. And are there particular states—I think there was an example of Colorado where the approval process went through and—

Mr. POLKOWSKY. Well, Colorado took a multi-pollutant, multi-target approach for looking at not only visibility at Rocky Mountain National Park and other 12 Class I areas but also looking at the nitrogen deposition and ozone on the front range and combined all that together as part of the Regional Haze Plan and EPA approved it.

Ms. BONAMICI. Terrific. My time's about to expire. I yield back. Thank you, Mr. Chairman.

Chairman BRIDENSTINE. The gentlelady yields back.

I now recognize the gentleman from Texas, Mr. Neugebauer, for five minutes.

Mr. NEUGEBAUER. Thank you, Mr. Chairman.

Mr. Yeatman, earlier this month on March third, a lawsuit was filed by Texas utilities under the Regional Haze issue, and the state of Texas had to respond to an egregious action by EPA. In this case, EPA waited more than six years to disapprove the Texas State Implementation Plan and replace it with a Federal Implementation Plan that imposes interim compliance requirements that some people say cannot be met.

You know, it's kind of interesting when EPA rejected the Texas plan based on that—on direct reasonable progress into source-specific analysis, and I think the tenth Circuit actually ruled that the source-specific analysis in determining reasonable progress was not required either by the law or the regulation. Isn't this just kind of a bullying of the coal industry and trampling on the states' plans and rights?

Mr. YEATMAN. It is certainly, I would argue, an instance of inappropriate treatment of the states, an inappropriate—an absence of respect for the state's decision making, indeed, the state's authority pursuant to the Clean Air Act.

If I might add very briefly, at the outset of your question you noted that EPA waited six years to approve and act on Texas's plan, and that's actually a big component of this Regional Haze regime, that EPA has 18 months by statute to judge a state plan, and yet what it has done time after time and state after state is sit on these plans well past the 18 months, and what that does is under the Clean Air Act, environmental groups are allowed to sue the EPA to compel missed deadlines. The upshot is, because EPA has not been meeting its statutory responsibilities to review state plans in a timely fashion, they've opened themselves up to what are known as these "sue and settle" litigations or lawsuits whereby they become beholden to these ultra-rushed deadlines, these ultra-rushed rulemakings of which Texas was one.

So that is a facet I wasn't able to address in my oral testimony but it is an important element of this regime as implemented. The Agency simply has not been meeting its statutory responsibilities in reviewing these plans. They've left states twisting in the wind.

Very briefly, I'll note that Texas submitted its plan in 2009 in accordance with 2006 document—I'm sorry—guidance documents on Regional Haze issued by EPA. So Texas was using the most recent documentation while EPA sat on the Texas plan. They issued updated guidance on which the Texas plan was judged. So it's sort of, you know, after the fact review with respect to—or I guess a bait and switch. I'm not sure what metaphor I'm looking for. But Texas based its plan on the rules that were in play when they submitted it. EPA waited six years, changed the rules, and then judged the Texas plan based on different rules. So I'm glad I was afforded the opportunity to discuss that matter.

Mr. NEUGEBAUER. Well, you know, it's my understanding that EPA's own monitors showed that Texas had already achieved its visibility goals. Can you address that? How does that make sense?

Mr. YEATMAN. You're exactly right. Again, EPA is going to base its regulation upon model results. However, real-world results, the

last five years, the running average at the Big Bend National Park indicates that Texas has already achieved EPA's 2018 goal. So despite the fact that Texas has already achieved EPA's 2018 goal, EPA's own goal, and despite the fact that EPA's controls don't result in any visibility benefit and they cost about two billion dollars, you know, EPA proceeded the pace. So it is—that's another troubling aspect certainly of the Texas FIP.

Mr. NEUGEBAUER. So let me understand that. So waited five years, and then Texas was already meeting the goal, but EPA denied their plan and said we want you to do a new plan, which as I understand will force Texas to spend \$2.8 billion to increase an already 28.4-mile view by the length of seven football fields. Does that make sense for—I think that's \$2.8 million a yard.

Mr. YEATMAN. That sounds—now, cost figures I have heard I guess perhaps closer to two billion dollars. Nonetheless, we're talking billions of dollars for benefits that are literally invisible. So the only dispute I would have with your comment, respectfully, is that Texas achieved the EPA's goal over the last five years while EPA was dithering on its plan.

Mr. NEUGEBAUER. Thank you. I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

I now recognize the Ranking Member, Ms. Johnson, for five minutes.

Ms. JOHNSON. Thank you very much, Mr. Chairman.

Mr. Polkowsky, I appreciated your quoting President Teddy Roosevelt in your testimony as he was surely someone ahead of his time in contemplating issues and environmental health. In 1908 in a speech given at the opening of the Conference on Conservation and Natural Resources, he said, "But the time has come to inquire seriously what will happen when our forests are gone, when the coal, the iron, the oil and the gas are exhausted, when the soil shall be still further impoverished and washed into streams, polluting the rivers, denuding the fields, obstructing the navigation. These questions do not relate only to the next century or to the next generation. It is time for us now as a Nation to exercise the same reasonable foresight in dealing with our great natural resources that would be shown by any prudent man and conserving and widely using the property which contains the assurance of well-being for himself and his children."

More than 100 years later, it seems that we still are working against the forces that would keep us from achieving the vision laid out by President Roosevelt when he had this in mind. Why is it important that we continue to improve the air quality for our National Parks and around the country? Is it simply good enough to achieve some arbitrary standard or should we strive to make good on the words of President Roosevelt?

Mr. POLKOWSKY. Well, I certainly think we should make good on the words of President Roosevelt, and I think that sort of having a false dichotomy of looking at this as visibility protection or public health is just—it's wrong. We live in one atmosphere, and we should be striving to get that atmosphere as clean as we can, to improve public health, to improve the aesthetic quality of our parks and wilderness areas as one program moving forward. And I think

the history of looking at EPA's Visibility Protection program has been one of applying careful science to exactly that goal.

Ms. JOHNSON. Thank you. The Clean Air Act's Visibility Protection program is grounded in science, showing that reducing pollution that scatters light like sulfur dioxide, nitrogen oxide, and particulate matter results in cleaner and clearer air. Visibility impairment is measured in deciviews, a measure of the perceptive change in visibility where the higher the deciview value, the worse the visibility impairment.

In his testimony, Mr. Yeatman suggests that because the average person may not be able to perceive or visibly discern the reduction in haze achieved through the additional controls required by EPA and because of that, the controls are not worth the added cost. Do people actually notice visibility improvement? Is a one deciview of visibility improvement, or conversely, degradation, actually perceptual to a National Park visitor? And can we explain why emissions reductions result in less than a deciview of improvement are needed to advance the Clean Air Act objectives?

Mr. POLKOWSKY. The answer is that any given view can take anywhere from a half a deciview to be visible to several deciviews but people in general on views that incorporate a wide aspect of contrast change and enough sky color can see a one-deciview change. A study in Phoenix looked at a deciview change over one deciview at a time from 14 deciviews to 32 deciviews, and people ranked those, 385 people ranked those in absolute order from good to bad, and that wouldn't have happened if they couldn't perceive a change of a deciview.

And so it's really important that we also make progress towards improving these deciview readings at these parks and wilderness areas, and you can only do that incrementally, and one single source may only move a fraction but the courts and EPA have said that, you know, this is the way you move forward.

Ms. JOHNSON. Thank you very much. My time is about to expire.

Chairman BRIDENSTINE. The gentleman from Louisiana, Mr. Abraham, is recognized for five minutes.

Mr. ABRAHAM. Thank you, Mr. Chairman.

Mr. Polkowsky, in your testimony you mentioned innovation implementation of EPA's rules and orders, and I would probably argue that I would use a different adjective that probably in this public forum would not be appropriate in my opinion.

I've heard when Mr. Neugebauer, you said, Mr. Yeatman, that Texas has achieved its own goal, and the states are doing a wonderful job. I've heard that this implementation of EPA's rules in this instance would cost billions of dollars and increase energy costs, as you said, Mr. Schroedter. And again, I don't think anybody on this panel doesn't want clean air and beautiful, pristine national parks, but I think I could argue that with the billions of dollars, the increased energy costs, states doing a great job themselves, that the consumer is not going to be able to afford to go to the parks if this goes into law.

Now, I'm a physician by trade, so I have to make decisions on objective data and hard science, and Mr. Yeatman and Mr. Flynn, I'll address this question to you. What science and modeling has

the EPA used to come up with this? I mean, I can't find any, and maybe I'm missing something, but I'll let you respond.

Mr. YEATMAN. Thank you for the question. There are no tricks. I mean, this is—what I demonstrated to you was precisely what EPA is bringing to the table. With respect to the previous discussion about deciview and visibility, that Oklahoma picture, the side-by-side one, that was 2.89 deciviews. The Texas picture, that was .5 deciviews. Now, according to peer-reviewed research, there is a 20 to 40 percent change of the average person being able to view a one-deciview change. We saw that difficulty. It was evident when we compared the—

Mr. ABRAHAM. But the EPA claimed that the average person can pick up one single deciview. That can't be correct.

Mr. YEATMAN. Well, respectfully, I think EPA's language is "likely," so they use hedge words such as that. I don't think they've ever definitively said that one deciview indeed would be visible, and indeed, the agency never directly takes on for obvious reasons the putative benefits of its rule.

Mr. ABRAHAM. Thank you, Mr. Chairman. That's all I have. I yield back.

Chairman BRIDENSTINE. The gentleman yields back.

I now recognize the gentleman from Michigan, Mr. Moolenaar, for five minutes.

Mr. MOOLENAAR. Thank you, Mr. Chairman. Thank you, panelists.

Mr. Yeatman, I wanted to ask you about the sue-and-settle lawsuits and this concept that according to your written testimony, every EPA disapproval of a state Regional Haze plan and every EPA Federal Implementation Plan has been rendered pursuant to a sue-and-settle lawsuit between environmental special interests and the Agency. I wondered if you could explain for us how that works and what are the practical ramifications for that?

Mr. YEATMAN. Thank you very much for the question. So it works—I laid it out in a previous answer. Really, it's a function of EPA's inability to meet its statutory responsibilities. EPA is leaving states twisting in the wind while it waits years to respond to these plans, and because the statute affords special interests the opportunity to sue the EPA to compel the Agency to meet its non-discretionary duties, what we have is a scenario whereby EPA sits on the plan, exceeds the statutory responsibility, opens itself up to litigation, that then leads to these—the practical ramification is a rushed deadline. State after state after state has complained that EPA is imposing these costs, these billion-dollar costs, and conducting these rulemakings on an ultra-tight schedule. So, you know, of course a rushed rulemaking is a shoddy rulemaking, so sue-and-settle itself in this instance is a function of the Agency's not meeting, failing to meet its statutory responsibilities in reviewing state plans, and the ultimate impact are rushed, poor rulemakings.

Mr. MOOLENAAR. And what is the state's role in that? I mean, they would be a stakeholder. Are they involved in that process?

Mr. YEATMAN. That's a wonderful question. I'm glad you brought that up.

The worst element, if you will, of the sue-and-settle component of this regulatory regime is that the Agency has actively litigated to oppose states from intervening in these sue-and-settle lawsuits, so that is—states are the regulated entity. They're EPA's partner under the cooperative federalism framework. So states become aware that these negotiations are occurring between EPA and special interests under the auspices of district court, federal district court. States want to intervene. You know, North Dakota has tried this, Oklahoma has tried this, Texas has tried this. They won't intervene and protect their interest. Again, cooperative federalism. They're the regulated entity. EPA when they haven't actively litigated to oppose state participation, they've ignored state stakeholders at the negotiating table. So that has been a very troubling aspect. I mean, perhaps the most egregious affront to cooperative federalism has been EPA's activity in the courtroom with respect to these sue-and-settle lawsuits.

Mr. MOOLENAAR. Thank you for clarifying that.

Mr. Schroedter, am I pronouncing that right?

Mr. SCHROEDTER. Yes.

Mr. MOOLENAAR. Thank you. In your written testimony, you mention the regressive economic nature of this regulation, and I wondered if you'd go into more detail for us on how this rule widens the income inequality gap.

Mr. SCHROEDTER. Yes. In my testimony, I point out that, for example, with respect to the impact on households that first of all, Oklahoma households spend an average of 12 percent of their after-tax incomes on energy. Eight hundred and twenty-seven thousand Oklahoma households earn less than \$50,000 per year, and they spend 21 percent of their after-tax incomes on energy. Three hundred and eighty-one thousand households with annual incomes of \$10,000 to \$30,000 spend 25 percent of their after-tax income on energy. So you can imagine if we're talking about rate increases of ten percent to 20 percent, which is what's going to happen in Oklahoma, that these are going to be the most impacted, the lower income and those on fixed incomes, and it's a regressive ramification for Oklahoma households.

Mr. MOOLENAAR. And how about the effect on small businesses? Is that something that would force businesses to close shop or move to another state because of these costs?

Mr. SCHROEDTER. Well, on small businesses, you know, the electric—the energy cost can make a difference between making it and breaking it. If you're on the bubble, let's say, I mean, if you're barely getting by and you get hit with a 10 to 15 percent increase, not only that, but then you're looking at more increases, those businesses, those small businesses are likely not going to make it. They're going to shut down. Whether they move to another state I think is more for the larger industries and my members where if the electric bills become such that they are no longer competitive in their operations, they're going to move the production. What you'll see is, you'll see moving production to other states, and if other states get hit, then what'll happen? Offshore, perhaps, because it won't be competitively economic to manufacture the product. So that's a concern, a big concern.

Mr. MOOLENAAR. Thank you.

Chairman BRIDENSTINE. The Ranking Member has requested 30 seconds to make a second. Without objection, would that be all right? Okay.

Ms. BONAMICI. Thank you, Mr. Chairman. We have no other members on this side.

And I just wanted to request that we put into the record a Sustainable Energy in America fact book from 2016, Bloomberg New Energy Finance, that found "importantly surging renewables build and coal retirements have not triggered a dramatic leap in retail power prices. Average retail electricity rates across the country remain 5.8 percent below the recent peak 2008 in real terms in part due to cheap generation from natural gas." So without objection, I'd like to enter this into the record.

Chairman BRIDENSTINE. Without objection, so ordered.

Ms. BONAMICI. Thank you.

Chairman BRIDENSTINE. You're welcome.

[The information appears in Appendix II]

Ms. BONAMICI. Thank you, Mr. Chairman.

Chairman BRIDENSTINE. Real quick. On the sue-and-settle issue, my understanding is, the sue-and-settle rulemaking that affected the state of North Dakota was actually a lawsuit that happened in California. Are you aware of that?

Mr. YEATMAN. Yes, Chairman.

Chairman BRIDENSTINE. Now, explain to me why the EPA would sue to prevent North Dakota from having any kind of involvement in that rulemaking?

Mr. YEATMAN. A matter of legal strategy. The Agency—ultimately, it's not the EPA that's suing, it'll be an environmentalist group that—

Chairman BRIDENSTINE. Okay.

Mr. YEATMAN. —would bring the suit to compel EPA to do its duty. It is the Northern District Court of California, and the Bay area is perceived by such litigants as being more favorable to their cause, if you will, than other courts. So that's why they wouldn't go to North Dakota, a federal district court. That's why they would say you find this unusual arrangement whereby EPA is negotiating with an environmental special interest in a northern California court North Dakota's regulatory responsibilities.

Chairman BRIDENSTINE. Could EPA not—so could EPA not—working with the state, could EPA not bring North Dakota to the negotiation?

Mr. YEATMAN. That was the very suit that North Dakota AG Wayne Steinem tried to intervene and the Agency actually litigated to prevent, so it was—

Chairman BRIDENSTINE. When you say "the Agency," who is "the agency"?

Mr. YEATMAN. Well, the Environmental Protection Agency working with the Department of Justice.

Chairman BRIDENSTINE. So the Agency did sue to prevent North Dakota from having a seat at the table?

Mr. YEATMAN. I guess legalese, slight difference. I mean, they litigated—they were already part of the suit as the respondent. They joined with the environmental special interests to prevent intervention of right by North Dakota.

Chairman BRIDENSTINE. That is absolutely bullying states.

I now recognize the gentleman from Alabama, Mr. Palmer, for five minutes.

Mr. PALMER. Thank you, Mr. Chairman. I just want to follow up on this issue of how higher energy costs impact families. To the point that was made, income—families with incomes below \$30,000 spend almost a quarter of their disposable after-tax income on household energy. That's just now, right now. Among those are senior citizens, which make up, I forget, 20 something million households. Their median income is somewhere below \$34,000 a year, has a tremendously negative impact on their disposable income, and it's also interesting to note that the National Black Chamber of Commerce has addressed this issue in regard to the Clean Power Plan, and I think this goes along the same lines, and they project that if these EPA regulations go into effect that it's going to increase poverty, household poverty among African-Americans by 23 percent, and by 26 percent among Hispanic families.

That said, there's some issues here that are very troubling to me, and the gentleman from Michigan, Mr. Moolenaar, touched on it, and that is this whole issue of sue-and-settle and consent decrees. I've done a substantial amount of work on the issue of consent decrees at the state level and also looked at the federal level. As a matter of fact, I coauthored a paper back a few years ago on how state legislatures can protect themselves.

But what's going on right now is outside of what we've seen in years previous. And Mr. Yeatman, you can respond to this. Why would you think the EPA hasn't fought these suits through the courts including going all the way through the appeals process to get a judgment rather than simply entering into a consent decree? You can use your imagination.

Mr. YEATMAN. It is a fantastic question, and it's an issue we've been pressing at CEI is for the Agency to defend its discretion, to defend its prerogatives, to establish its own priorities instead of being beholden to environmental special interests and having these unelected, again special interests, in effect dictate the Agency's limited resources. It is—I'm loathe to put a cause behind it. I can only find it—I find it inexplicable.

Mr. PALMER. Well, I can tell you this. In cases that I studied where states and the federal government in some cases but most of my work was at the state level, it was very evident that state agencies wanted to enter into a consent decree because it was their way of bypassing the legislature. They were able to increase spending, expand their programs by court order. I mean, what a wonderful opportunity to do that.

I would—again, using our imagination, I would go so far as to say that it appears to me, Mr. Chairman, that the EPA is acting in collusion with environmental groups to achieve their agenda, whatever it may be, of regulating outside their statutory authority, and I think that's a huge issue. Would you like to respond, Mr. Yeatman?

Mr. YEATMAN. If I might speak to that issue, for whatever reason, a pioneer in this Regional Haze regime has been EPA Region 6, and that's Texas, Louisiana, Arkansas, Oklahoma, New Mexico. In 2010, so a number of these sue-and-settle consent decrees—you

know, one consent decree that affected Region 6 states, we know it was brought by Wild Earth Guardians in 2010. We know that the then-EPA Region 6 Administrator, Al Armendariz, who you might remember resigned in some controversy when he compared his enforcement style to that of a crucifixion, we know that he used to work at Wild Earth Guardians. We know that after he resigned from the EPA, he joined the Sierra Club. We learned from a FOIA that there were contacts between Al Armendariz and his former colleagues at Wild Earth Guardians regarding the actual—regarding the sue-and-settle consent decree or the sue-and-settle process, and he was actually told by the EPA, whoa, you cannot be doing that.

Mr. PALMER. Well, let me tell you what else we've discovered in that regard. We know that the EPA was holding seminars to teach their employees how to avoid FOIAs and National Archives and records requests by using websites set up by outside groups and maintained by outside groups. So there is collusion here, and Mr. Chairman, it may be in our best interests to hold a hearing to see if there might even be criminal activity here. Because it seems to me that there's a fraud being perpetrated upon the American people, and I'm going to make this as my closing statement.

What really bothers me about this is the EPA is trying to regulate everything from ditch water to the climate, now the aesthetics of the environment, yet they covered up one of their own scientists' reports in Flint, Michigan, about the lead in water up there. They released millions of gallons of toxic material into creeks in Georgia and denied that they did it and finally had to admit it, and then by their own action released millions of gallons of toxins into the Animas River that flowed all the way down into Colorado and Utah and New Mexico and tried to cover that up. I think we need to dig deeper into this. I yield the balance of my time.

Chairman BRIDENSTINE. The gentleman from Alabama, Mr. Palmer, makes great points.

I recognize—remember, this is a fly-out day so they're not likely to hold votes open for very long. We've got about ten minutes left. I recognize Mr. Babin from Texas for five minutes.

Mr. BABIN. Thank you very much, Mr. Chairman, and I'm just going to be very, very brief, and I appreciate what Mr. Palmer—those questions that he just asked, and right along those same lines, in your written testimony, Mr. Yeatman, you explained how EPA repeatedly has employed a supposedly independent consultant to second-guess state determinations on Regional Haze. However, during the same period, this same independent consultant has also worked on Regional Haze rules for environmental special interests like the Sierra Club. Does this lead you to question the EPA's independence? And I would like for you to explain. And then also, to your knowledge, how long has this type of arrangement been going on, and which state determinations have been affected by her involvement? Thank you.

Mr. YEATMAN. Thank you for the question. Yes, this raises serious conflict-of-interest concerns. This independent consultant has been employed by the Sierra Club with the National Parks Conservation Association on I believe it's six different Regional Haze rulemakings. I can—in the record, I can put down the states. I

don't know them off the top of my head. At the same time, she's been employed by the EPA for five different rulemakings. So this is the same—during the same Administration, the same regulatory regime, the same independent consultant, and just to clarify what's going on here, the states spent thousands of hours on these Regional Haze plans. These Regional Haze plans are thousands of pages long. It's a lot of expertise. It's a lot of resources that states expend on them. This independent consultant, who again seems to be playing both sides of the field here, based on her analysis, EPA is disapproving the state plan. So we've got on the one hand a co-sovereign of the United States, thousands of hours of work. On the other hand, that work being effectively shown to the side, cast by the wayside due to the input of this one contractor.

So it is one other point with respect to this. Sierra Club is one of the environmental special interests that has been involved in each of the sue-and-settle lawsuits that have led to these deadlines for these rulemakings. That means that EPA before the courts and Sierra Club are adversaries on this, you know, putatively or supposedly, you know, in our adversarial legal system they're on opposite sides of the coin. However, at the same time, they're employing the same independent consultant. I mean, it just, again, raises these, I would argue serious conflict-of-interest concerns.

Mr. BABIN. Absolutely. I thank you for that.

Mr. Chairman, to save time so we can go vote, I yield back the balance of it.

Chairman BRIDENSTINE. I'd like to thank the gentleman from Texas.

I thank the witnesses for their valuable testimony today and the members for their questions. The record will remain open for two weeks for additional comments and written questions from the members.

Mr. Babin, if you have additional questions, you can certainly submit them for the record.

This hearing is adjourned. Thank you.

[Whereupon, at 10:49 a.m., the Subcommittee was adjourned.]

Appendix I

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

Responses by Mr. William Yeatman

Responses to Hearing Questions for the Record from the Honorable Jim Bridenstine (R-OK)

1. In his written testimony, Bruce Polkowsky states that "Protection of visibility at our most treasured parks and wilderness areas drives economic progress in those regions and nationally." To support this statement, he cites a National Park Service estimate that tourism to federal Class I areas generated almost \$30 billion in economic output.

In fact, Mr. Polkowsky's reference to the NPS estimate is apropos nothing. This is because none of the Regional Haze FIPs imposed by the EPA since 2009 would improve visibility. At the hearing, I drew the Subcommittee's attention to side-by-side images that depict the visibility "improvement" attributable to EPA's Regional Haze FIP for Oklahoma. As was evident to the Subcommittee and the witnesses, there was no difference in visibility between Oklahoma's SIP and EPA's FIP. To be sure, there was a difference in compliance costs—the EPA FIP was about \$2 billion more expensive. As I explained at the hearing, the Oklahoma FIP resulted in the greatest visibility "improvement" of any of EPA's FIPs.

Given that the highest level of visibility improvement engendered by EPA's Regional Haze FIPs is invisible, it follows that none of EPA's FIPs had a discernable effect on visibility at federal Class I areas. And if the rule had no impact on visibility, then it doesn't make any sense for Mr. Polkowsky to claim that the rule would impact the economy.

In sum, the benefit of EPA's Regional Haze rule are literally nothing, and it's impossible for nothingness to stimulate the economy. Unlike the Regional Haze rule "benefits," the costs of the rule are real. These tangible costs will exceed \$5 billion, and they will harm economic progress.

2. In his written testimony, Mr. Polkowsky stated that he had to issue 35 FIPs for visibility protection. Presumably, he was referring to the EPA's Regional Haze FIP for 29 States that was implemented in 1987 (see 52 FR 45132). Mr. Polkowsky seemed to imply that these FIPs from 1987 are comparable to EPA's 15 Regional Haze FIPs during the Obama administration, but this is incorrect. In fact, these FIPs are like night and day. Not one of the 29 FIPs in 1987 resulted in a substantive regulatory action imposed on States. In announcing the 29 FIPs, EPA explained "control strategies to remedy existing impairment" were "unnecessary" for 28 States" for the remaining FIP, the EPA deferred its decision on whether or not controls were necessary. The upshot is that the 1987 FIPs entailed zero compliance costs.

By contrast, EPA's 15 FIPs during the Obama administration have cost in excess of \$5 billion, in order to achieve a visibility "improvement" that is literally invisible.

Responses to Hearing Questions for the Record from the Honorable Lamar Smith

1. During his testimony, Mr. Polkowsky stated that differentiating between public health regulations and aesthetic regulations is a "false dichotomy." I strongly disagree with this statement. So did Congress, which is why the Regional Haze program is structured differently than public health regulations. For National Ambient Air Quality Standards—i.e., public health regulations—EPA sets the target, and then States submit plans to comply. With Regional Haze, by contrast, States are supposed to set the target and craft plans to comply. The difference is not coincidental. Rather, it reflects the Congress's common-sense intent for States—and not the EPA—to decide the optimal path towards the national goal of pristine air.

2. It is incorrect to claim that, absent EPA's final Regional Haze rule, Texas sources would be uncontrolled. In fact, there is no such thing as an "uncontrolled" source in Texas. All major and area sources of haze-causing pollution are subject to NSPS, NESHAP, or NAAQS. And all three of these programs are designed to be reviewed and updated periodically (every 8 years for NSPS & NESHAP; every 5 years for NAAQS). Thus, the Clean Air Act has been ratcheting up controls on Texas stationary sources for more than 40 years.

Crucially, EPA's own Regional Haze rules provides that States may rely on existing public health regulations in order to achieve Reasonable Progress towards the national goal for Regional Haze. See 50 C.F.R. §51.308(d)(vi).

Mr. Polkowsky's written testimony demonstrates this point clearly. In it, he includes side by side images of the Great Smoky Mountains National Park in Tennessee. The left image, which is very hazy, is from 1990; the right image, which is much clearer, is from 2012. However, not a single Regional Haze regulation had been implemented in Tennessee or surrounding States in 2012. The inescapable conclusion is that the impressive visibility improvement depicted in Mr. Polkowsky's testimony is due to the implementation of public health controls from 1990 to 2012 and has nothing to do with Regional Haze. In this manner, Mr. Polkowsky demonstrates my point: there is no such thing as an uncontrolled source. Under the structure of the Clean Air Act, it is perfectly reasonable for a State to achieve Reasonable Progress on Regional Haze by relying on its compliance with public health regulations.

Responses by Mr. Thomas P. Schroedter

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Environment**

**Hearing Questions for the Record
The Honorable Jim Bridenstine (R-OK)**

Examining EPA's Regional Haze Program: Regulations Without Visible Benefits

Mr. Schroedter

1. During the hearing, Ranking Member Bonamici introduced a report into the record (<http://about.bnef.com/content/uploads/sites/4/2016/02/BCSE-2016-Sustainable-Energy-in-America-Factbook.pdf>) and stated that this report found that "surging renewables build and coal retirements have not triggered a dramatic leap in retail power prices. Average retail electricity rates across the country remain 5.8 percent below the recent peak 2008 in real terms in part due to cheap generation from natural gas."

Do you agree with this report's findings or were the report's findings taken out of context?

Although the report's findings may accurately reflect the impact of renewable energy resources and coal plant retirements on current power prices, over time the loss of coal-fired energy resources and increasing renewable energy levels is likely to result in higher and more volatile retail power prices in most regions. History has shown that natural gas prices are subject to spikes and volatility due to severe weather and other market forces. In addition, while wind energy prices are currently competitive with the price of conventional energy resources in Oklahoma and certain other regions, the price of renewable energy generally is heavily dependent on tax credits which may be terminated in the future. For these reasons, it is generally preferable to maintain a diverse portfolio of conventional and renewable power supply resources in order to ensure retail power prices remain low over the long run.

What has been your experience in OK?

Oklahoma has abundant high quality wind energy resources that currently can be purchased under 20-year contracts at prices that are competitive with electric energy supplied from coal and natural gas energy resources. Nevertheless, recent coal plant retirements in Oklahoma will result in significantly higher retail power prices due to the high cost of replacement capacity and energy required to replace such plants.

What have other reports stated about the trajectory of retail electricity rates across the country?

Most recent published forecasts of retail electricity rates we have reviewed generally predict modest growth over the next twenty years. This trend appears to be primarily due to relatively low growth in energy sales, growth in energy efficiency programs, and current low natural gas price forecasts. However, future retail electricity prices are likely to be significantly impacted by new environmental regulations and the price of natural gas, which historically has been volatile and difficult to predict.

Also, what additional factors should have been properly considered to give a more complete picture of reality of retail electricity rates across the U.S.?

Retail electricity prices vary significantly across the U.S. due to regional differences in generating resource mix and reserve margins, retail regulations, environmental policies, taxes, and other factors. These interregional differences should be evaluated, along with sensitivity analyses of future load growth and natural gas prices, in order to provide a more refined and complete long-term forecast of retail electricity prices across the U.S.

In addition to the Regional Haze Regulation, are you concerned about meeting the multitude of other EPA imposed air-regulations, including Clean Power Plan and the ozone NAAQS? What additional EPA regulations (proposed and finalized) are you concerned about that would severely affect consumers and small businesses in your state? What will be the cumulative impact of all these regulations?

We are certainly concerned with the impacts of proposed and final EPA regulations on future electricity prices. The cumulative rate impact of future environmental regulations is very difficult to predict at this time, particularly over the long-run. However, the actions taken to date by Oklahoma utilities for compliance with the Mercury and Air Toxics Rule, the Regional Haze Rule and the Clean Power Plan are projected to result in initial retail rate increases in the range of 20% to 30%.

2. What happens to Oklahoma's competitive advantage if EPA regulations push electricity prices up?

Oklahoma's current competitive advantage in electricity prices will decline as a result of EPA regulations and could easily evaporate if future EPA regulations become more stringent or introduce further uncertainty to the electric power supply planning process.

3. You testified that EPA's Regional Haze FIP will have severe consequences for Oklahoma energy prices. Do you think outcomes like this are why Congress gave states a substantial role in the Regional Haze Program?

Yes. Oklahoma and other states are most familiar with the specific characteristics of local utilities and electricity markets and therefore are in the best position to develop reasonable and cost-effective solutions for compliance with the Regional

Haze Program and other EPA regulations. For example, the State of Oklahoma evaluated various proposals for Oklahoma electric utilities' compliance with the Regional Haze Program and determined that a strategy of burning lower sulfur coal would provide the most reasonable and cost effective solution for Oklahoma. Unfortunately, EPA rejected the Oklahoma state compliance plan and mandated that Oklahoma's utilities instead retrofit expensive flue gas desulfurization systems ("scrubbers") on existing coal plants or, in the alternative, retire and replace those plants with gas-fired generating facilities. The estimated cost of new utility investments required to meet EPA's alternative Regional Haze compliance plan is several billion dollars higher than what would have been required under Oklahoma's recommended compliance plan.

Do you think this is what Congress was trying to prevent?

Yes. It was certainly not in the best interest of Oklahoma's citizens or industry to be forced to pay for the several billion dollars of new electric utility capital investment that was required to meet EPA's Regional Haze compliance plan. The State of Oklahoma's original Regional Haze compliance plan was expected to achieve a similar level of visibility improvement at a much lower cost through use of ultra-low sulfur coal at Oklahoma power plants.

Responses by Mr. Bruce Polkowsky

Response to Questions

Questions for the Record to Mr. Bruce Polkowsky
Submitted by
Ranking Member Eddie Bernice Johnson
Committee on Science, Space, and Technology

Question 1. The regional haze program like other Clean Air Act programs is based on a model of cooperative federalism. Implicit in such a model is the role of EPA to ensure that the plans and actions proposed by a state conform with the requirements and goals of the Clean Air Act to address regional haze. Despite this fact, a number of witnesses at the hearing suggested that EPA was overreaching its authority by issuing Federal Implementation Plans in place of State Implementation Plans that EPA determined were insufficient. Specifically, Mr. William Yeatman stated that EPA was “seizing a small piece of state sovereignty.”

- Can you please describe the oversight role mandated to EPA under the Clean Air Act?
- Can you respond specifically to the assertion that EPA is “overreaching” its authority when it decides to issue a Federal Implementation Plan?

Response:

Under the Clean Air Act, each State must timely submit a State Implementation Plan (SIP) to EPA that meets the Act’s various requirements, including the requirements pertaining to visibility protection for covered national parks and wilderness areas.¹ If EPA determines that a SIP has not been submitted, is incomplete, or fails to meet the Act’s requirements, then the Clean Air Act requires EPA to promulgate a Federal Implementation Plan (FIP) at any time within 2 years after EPA makes that determination (unless the State first corrects the deficiency).² In a recent case challenging EPA’s FIP authority, the Supreme Court held that if EPA determines that a SIP is inadequate, then the Agency has an “absolute” mandate to replace it with a FIP. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1600 (2014).³ Furthermore, when EPA promulgates a FIP pursuant to Section 7410(c)(1), “EPA stands in the shoes of the defaulting State, and all of the rights and duties that would otherwise fall to the State accrue instead to EPA.” *Central Ariz. Water Conservation Dist. v. EPA*, 990 F.2d 1531, 1541 (9th Cir. 1993). In other words, when EPA issues a

¹ See 42 U.S.C. §§ 7410(a)(2)(J), 7491, 7492; see also *Oklahoma v. EPA*, 723 F.3d 1201, 1207 (10th Cir. 2013), *cert. denied*, 134 S. Ct. 2662 (2014).

² See 42 U.S.C. § 7410(c)(1).

³ While *EME Homer City* was not a regional haze case, the Court’s holding strongly affirms EPA’s FIP mandate under Section 7410(c)(1), which applies to all SIP requirements, including those for regional haze.

FIP, it is neither “overreaching” nor “seizing a small piece of state sovereignty”—it is simply fulfilling its obligations under the Clean Air Act.

The U.S. Courts of Appeals have repeatedly rejected challenges asserting that EPA has “overreached” its authority when issuing a regional haze FIP or disapproving a State’s approach to the Clean Air Act’s regional haze requirements. As recently held by the U.S. Court of Appeals for the Tenth Circuit, the Clean Air Act requires EPA to review all regional haze SIPs to ensure that the plans comply with the statute. *See Oklahoma v. EPA*, 723 F.3d at 1208. The U.S. Courts of Appeals for the Eighth and Ninth Circuits have also recently upheld EPA’s review, disapproval and promulgation of federal actions to redress failures and omissions in States’ regional haze plans. *See North Dakota v. EPA*, 730 F.3d 750, 766 (8th Cir. 2013) (rejecting North Dakota’s challenge to EPA’s disapproval of the State’s regional haze SIP and promulgation of a FIP), *cert. denied*, 134 S. Ct. 2662 (2014); *Nebraska v. EPA*, 812 F.3d 662, 667 (8th Cir. 2016) (rejecting Nebraska’s challenge to EPA’s disapproval of the State’s regional haze SIP); *Arizona v. EPA*, No. 13-70366, slip op. at 34 (rejecting Arizona’s challenge to EPA’s disapproval of the State’s regional haze SIP).

In the above cases and others, courts have unequivocally affirmed EPA’s authority to review a State’s determinations and take action to correct errors and deviations from requirements of the Regional Haze Rule and guidelines for implementation of the Rule.

Response to Questions

Questions for the Record to Mr. Bruce Polkowsky
 Submitted by
 Ranking Member Eddie Bernice Johnson
 Committee on Science, Space, and Technology

Question 2. During the course of the hearing a number of witnesses invited by the Majority suggested that the Federal Implementation Plan being implemented by EPA in the State of Texas would not result in any meaningful benefits. Specifically, Mr. Flynn state that EPA's plan "would cost approximately \$2 billion more than Texas' plan while achieving no appreciable incremental visibility benefit. And DDPA's own monitors confirm that the Agency's Reasonable Progress goals for Texas are being achieved today based on reductions that have already occurred, rendering EPA's plan unnecessary."

- Can you please briefly describe the inadequacies in Texas' regional haze plan and the need for EPA to issue a Federal Implementation Plan?
- Specifically, can you please describe both the health and economic benefits that will be achieved for Texans through the implementation of EPA's plan?
- Can you also respond specifically to the assertion that EPA's plan will not make an appreciable difference?

Response:

Texas emits more sulfur dioxide than any other state in the country. That is not because Texas is a larger state; it is because many Texas power plants lack the pollution controls widely used in other states. Despite the massive amount of visibility-impairing pollution coming from Texas sources, the Texas regional haze plan did not require a single source to install any controls to reduce haze-causing air pollution. Moreover, the Texas plan would not have achieved natural visibility conditions at Big Bend and the Guadalupe Mountains National Parks until more than a century after the 2064 natural visibility goal. In addition, the plan would have allowed Texas sources to continue to impair visibility at Oklahoma's Wichita Mountains and other out-of-state national parks and wilderness areas without having to install the kinds of pollution controls that have been required from other states to benefit the same places.

EPA's haze plan will reduce excessive air pollutant emissions at eight power plants in Texas and will improve visibility in nineteen national parks and wilderness areas in seven different states, including Texas and Oklahoma. The plan also will provide public health and economic benefits to the people who live, work, and breathe the air around these power plants, as well as the thousands of people who visit and work in these national parks and wilderness areas.

Inadequacies in the Texas Regional Haze Plan Giving Rise to EPA's Federal Plan

The Texas regional haze plan was legally inadequate in multiple respects, providing EPA with multiple, separate grounds for disapproving the haze plan submitted by Texas. I will discuss only some of the major inadequacies in the State's proposed plan. First, Texas did not accurately calculate natural visibility conditions at Big Bend and Guadalupe Mountains. Second, Texas's statewide reasonable progress analysis did not comply with Clean Air Act requirements. Third, Texas's reasonable progress goals for Big Bend and Guadalupe Mountains violate applicable Clean Air Act requirements. Finally, Texas's long-term strategy was based on a technically inadequate consultation with Oklahoma and did not require the control measures needed for reasonable progress at the Wichita Mountains. Each of these significant flaws in Texas's haze SIP compelled EPA to disapprove the State's plan.

Inaccurately Calculated Natural Visibility

Unlike every other state, Texas chose to calculate natural visibility at Big Bend and Guadalupe Mountains based on an approach that departed from EPA's standard methodology. The result is an artificially inflated calculation of "natural visibility" conditions, meaning that had EPA not correct the calculation, natural conditions would not be restored at these national parks. As EPA found in its Federal Implementation Plan Proposal,⁴ Texas departed from standard methodology by determining that all coarse mass and fine soil measured at Guadalupe Mountains National Park and Big Bend National Park in the baseline period was attributable to natural causes.

EPA explained that coarse mass and fine soil pollution is often caused by dust from paved and unpaved roads, agricultural activity, and construction activities—all of which occur in Texas. EPA noted that using the more scientifically supported apportionment of the amount of coarse mass and fine soil to natural sources would change the Texas determination of "uniform rate of progress" targets for 2018. EPA found Texas use of a higher natural visibility impairment skewed the slope of the uniform rate of progress, making it appear that a much lower rate of progress would be sufficient. The skewed uniform rate of progress biases the evaluation of what progress is "reasonable" in favor of doing less to reduce anthropogenic impairment. Because both natural visibility impairment and the uniform rate of progress are based on the state's flawed estimate of natural visibility conditions, EPA's disapproval of the Texas estimate was appropriate and EPA's action to repair this deficiency in the FIP was necessary.

⁴ 79 FR 74818

Inadequate Statewide Reasonable Progress Analysis

A state is required to adopt “enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.”⁵ Moreover, because Texas causes or contributes to impairment in other states’ mandatory Class I areas, Texas “must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area.”⁶

The State of Texas’s Regional Haze Plan did not sufficiently address how emissions from the state affected reasonable progress at the two mandatory Federal class I areas in the state as well as those Class I areas affected outside of the State. EPA found that Texas’s approach in aggregating visibility benefits and costs of reasonable progress control was not approvable as it did not comply with statutory and regulatory requirements. EPA properly disapproved Texas’s reasonable progress control analysis for at least two reasons. First, the aggregate visibility benefits of the controls Texas considered are significant enough that it was unreasonable for Texas to dismiss the controls out of hand. Second, by considering costs only in the aggregate, and failing to take a more fine-grained look at the costs of controls, Texas unreasonably rejected controls that met the state’s own cost effectiveness threshold of \$2,700 per ton, and which are well within the range of controls that EPA and numerous other states have found cost-effective. Texas’s faulty reasonable progress analysis provided EPA with a separate, independent ground for disapproval and it was appropriate for EPA to correct the deficiency.

Flawed Reasonable Progress Goals for Big Bend and Guadalupe Mountains National Parks

The reasonable progress goals that Texas established for Big Bend and Guadalupe Mountains do not provide for reasonable progress based on the four factors that a state is required to consider.⁷ Texas relied on improvements in visibility anticipated to result from federal, state, and local control programs and narrowed the scope of its control analysis to point sources of nitrogen oxides and sulfur dioxide. When adjusted to reflect EPA’s standard methodology, natural visibility conditions would not be attained at Big Bend until 2215 and Guadalupe Mountains until 2167. Texas’s proposed rate of progress is significantly slower than the uniform rate of progress; the State found it reasonable for its goals to extend so far out in time because contributions from Mexico and other international sources allegedly prevent Texas from achieving a faster rate of progress. However, the contribution from Mexico and other international sources is not a justification for such a slow rate of progress where cost-effective controls are available for Texas sources. Therefore it was

⁵ 40 C.F.R. § 508(d)(3).

⁶ *Id.* § 51.308(d)(3)(ii).

⁷ 42 U.S.C. § 7491 (g)(1)

proper for EPA to disapprove the Texas reasonable progress goals for its in-state Class I areas and correct the deficiency.

Long-term Strategy Based on Inadequate Consultation Process and Insufficient Reasonable Progress Control Measures

The Regional Haze Rule requires states to consult with each other and to implement a long-term strategy containing the emissions limitations and control measures necessary to reduce visibility impairment at both in-state and out-of-state Class I areas.⁸

Texas sources are the primary cause of visibility impairment at the Wichita Mountains Wilderness Area in Oklahoma.⁹ In fact, Texas sources cause more visibility impairment at Oklahoma's only Class I area than Oklahoma's own sources.¹⁰ Texas consulted with Oklahoma in a cursory manner and without providing Oklahoma and the other states the technical data necessary to identify the worst sources of visibility impairment in Texas and potential pollution controls for these sources.¹¹ Oklahoma informed Texas that Oklahoma's reasonable progress goals for Wichita Mountains would assume no additional pollution reductions from Texas sources, even though Wichita Mountains was far off the 2064 glide path and Texas sources were the primary reason why Wichita Mountains was not on track to restore natural visibility by 2064.¹²

EPA found Texas's "consultation" with Oklahoma violated both the Regional Haze Rule's consultation provision and the Rule's requirement that states adequately document the technical basis for the emission reductions necessary to achieve reasonable progress in downwind states' Class I areas.¹³ A cursory consultation with another state based on inadequate data is not the kind of consultation required by the Clean Air Act. EPA's conclusion that the regional haze regulations require a meaningful consultation based on sufficient technical analyses is reasonable and consistent with the visibility program's purposes.¹⁴

EPA also properly disapproved Texas's long-term strategy because Texas did not include the necessary control measures to obtain its share of the pollution reductions needed for Wichita Mountains.¹⁵ EPA found that Texas's technical analyses "did not provide the information needed to evaluate the reasonableness of controls on those sources with the largest potential to impact visibility at the

⁸ 40 C.F.R. § 51.308(d)(1)(iv), (d)(3)

⁹ 79 Fed. Reg. at 74,856

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.* at 74,855-56.

¹³ *Id.* at 74, 829, 74,856, 74,861.

¹⁴ *See id.* at 74,828-30, 74,856, 74,861.

¹⁵ 79 Fed. Reg. at 74, 829, 74,856-57, 74,861.

Wichita Mountains.”¹⁶ For these reasons, Texas’s long term strategy failed to meet statutory and regulatory requirements and EPA was just in disapproving these elements of the Texas plan and correcting identified deficiencies.

Health and Economic Benefits of EPA’s Plan

EPA’s FIP will have profound benefits by reducing 230,000 tons of sulfur dioxide annually from eight Texas coal plants. Sulfur dioxide increases asthma symptoms, leads to increased hospital visits, and forms particulates that aggravate respiratory and heart diseases and cause premature death. Sulfur dioxide also reacts with ammonia, moisture, and other compounds to form fine particulate matter that can penetrate deep into the lungs and cause a host of health problems, such as aggravated asthma, chronic bronchitis, heart attacks, and premature death.

Dr. George D. Thurston, a professor of Environmental Health at the New York University School of Medicine, and a nationally-renowned expert in the field, conducted a health risk analysis of EPA’s FIP. Using EPA-approved photochemical and health benefits modeling platforms, Dr. Thurston found that EPA’s proposed SO₂ emissions reductions will significantly reduce the serious public health toll imposed by Texas coal-burning power plants on residents of Texas and Oklahoma, as well as residents of Arkansas, Colorado, Illinois, Kansas, Louisiana, Mississippi, Missouri, and New Mexico. The written Report of George D. Thurston Regarding the Public Health Benefits of EPA’s Proposed Rulemaking Regarding Texas and Oklahoma Regional Haze (Apr. 18, 2015) can be found in EPA’s rulemaking Docket No. EPA-EPA-R06-OAR-2014-0754, comment No. 0071. Dr. Thurston estimates that EPA’s proposed SO₂ reductions for the 14 EGU units in Texas will save at least 316 lives each year, and prevent thousands of asthma-related or cardiovascular events and hospitalizations every year. Dr. Thurston “conservatively estimate[s]” the total public health-based economic benefits associated with these reductions will be at least \$3 billion each year. Dr. Thurston derived this estimate using an EPA-approved health risk modeling program, in which mortality change is the product of the projected change in air pollution, exposed population, incidence of mortality, and a “mortality effect estimate”. The mortality effect estimate is derived from peer-reviewed, published epidemiological studies. Table 1 summarizes the health effect benefits of EPA’s action.

Texas’s two national parks are important components of west Texas’s economy. In 2014, over 314,000 people visited Big Bend and over 166,000 people visited Guadalupe Mountains.¹⁷ Tourism at Big Bend in 2010 supported 372 jobs and resulted in over \$16.6

¹⁶ *Id.* at 74,857.

¹⁷ National Park Service, Annual Recreation visibility summary report for 2014, *available at* [https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Annual%20Visitation%20Summary%20Report%20\(1979%20-%20Last%20Calendar%20Year\)](https://irma.nps.gov/Stats/SSRSReports/National%20Reports/Annual%20Visitation%20Summary%20Report%20(1979%20-%20Last%20Calendar%20Year)).

million in visitor spending.¹⁸ Tourism at Guadalupe Mountains that same year supported 258 jobs and resulted in over \$13.3 million in visitor spending.¹⁹ Studies show that

Table 1. Health Benefits from EPA's Federal Plan²⁰

Health Endpoint	Expected Number Per Year Avoided ^a	Total Dollar Valuation (2010\$) ^{**}
Respiratory Hospital Admissions (Kloog et al., 2012; Zanobetti et al., 2009)	59 ^a	\$1,869,000
Cardiovascular Hospital Admissions (Bell et al., 2008; Peng et al., 2008; Peng et al., 2009; Zanobetti et al., 2009)	58 ^a	\$2,210,000
Acute Bronchitis (Dockery et al., 1996)	639	\$307,000
Acute Myocardial Infarction, Nonfatal (Pope et al., 2006; Sullivan et al., 2005; Zanobetti et al., 2009; Zanobetti & Schwartz, 2006)	38 ^b	\$4,732,000 ^c
Emergency Room Visits (Glad et al., 2012; Mar et al., 2010; Slaughter et al., 2005)	187 ^b	\$80,000 ^a
Asthma Exacerbation Symptoms (Mar et al., 2004; Ostro et al., 2001)	12,021 ^b	\$694,000
Upper Respiratory Symptoms (Pope et al., 1991)	11,606	\$386,000
Lower Respiratory Symptoms (Schwartz and Neas, 2000)	8,140	\$171,000
Minor Restricted Activity Days (Ostro & Rothschild, 1989)	302,891	\$20,669,000
Work Days Lost (Ostro et al., 1987)	51,228	\$7,634,000
Chronic Bronchitis (Abbey et al., 1995)	251	\$110,000,000 ^c
Mortality, All Causes (Krewski et al., 2009)	314	\$3,021,190,000
Mortality, All Causes (Lepeule et al., 2012)	714	\$6,869,213,000
Mortality, All Causes (Laden et al., 2007)	893	\$8,588,894,000

^a Rounded to nearest whole number.

^{**} Rounded to nearest \$1000.

^a Pooled effects with averaging approach, as per EPA BenMap default setting.

^b Pooled effects with random/fixed effects approach, as per EPA BenMap default setting.

^c Pooled effects with summation approach, as per EPA BenMap default setting.

national park visitors highly value clean air and prioritize the enjoyment of beautiful

¹⁸ Headwaters Economics, NPS Units; Economic Impacts of Visitation & Expenditures, available at <http://headwaterseconomics.org/apps-public/nps/impacts/>.

¹⁹ *Id.*

²⁰ Reproduced from the Thurston Report Table 1, Annual Multi-State Human Health Effects and Monetary Valuations Associated with the PM2.5 Air Pollution Avoided by Applying the Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility in Oklahoma and Texas.

scenery when visiting national parks.²¹ Moreover, national park visitors readily perceive haze, enjoy their visits less when haze is bad, and are willing to cut short visits to national parks based on their perception of air quality.²² A decrease in visits and visit length means less time and money spent in Texas's national parks and surrounding communities.

The regional haze program also provides important environmental benefits. In addition to impairing visibility, sulfur dioxide pollution harms plants and animals, water quality and soil health. Sulfur dioxide pollution is a primary cause of acid rain, which deteriorates water quality threatening ecosystems. Acid rain can also accelerate the decay of building materials, including irreplaceable artifacts of our cultural heritage. The National Park Service has documented acid rain impacts to cultural and geological resources in Guadalupe Mountains and Big Bend NP.²³

EPA's Plan WILL Make a Difference

As explained in the preceding section, EPA's plan will achieve more than \$3 billion each year in public health benefits, by preventing premature deaths, heart attacks, asthma attacks, and other negative health effects from air pollution. In addition, EPA's plan will make a substantial difference by significantly shortening the time needed to return visibility at Big Bend and Guadalupe Mountains to natural conditions on the most impaired days. EPA's plan will achieve natural visibility at the Guadalupe Mountains approximately 25 years sooner and at Big Bend approximately 30 years sooner than Texas's plan. So, not only will current generations see clearer skies as a result of the rule, an entire additional generation will see clear skies.

Given the location of the units affected by the EPA plan, the emissions controls required will have a greater effect on visibility improvements in Wichita Mountains wilderness area in Oklahoma, where emissions from Texas are the prominent contributor to visibility impairment on certain days.

Progress towards the national goal of eliminating human-caused regional haze is incremental, so no single source or single plan is required to have a perceptible change at all affected locations. This principle was affirmed in the legal challenge to the first source ever controlled for impacts to visibility at a mandatory federal Class I area, Navajo Generating Station in Page, Arizona. The United States Court of Appeals for the Ninth Circuit held that "even if the Final Rule addresses on a small fraction of the visibility impairment . . . EPA still has the statutory authority to address that portion of the visibility impairment".²⁴

²¹ Abt Assos. Inc., *Out of Sight: The Science and Economics of Visibility Impairment*, available at <http://www.abtassociates.com/reports/ES-clear.pdf>.

²² *Id.*

²³ *Air Quality in the National Parks, Second Edition*, NPS, ARD, D-2266, Sept. 2002

²⁴ *CAWCD v. EPA*, 990 F.2d 1531

EPA's plan constitutes a 3 deciview (dv) improvement on the 20% worst days at the Wichita Mountains Wilderness Area when looking at the impacts of the controlled plants on natural conditions. From the projected conditions in the technical basis for the Oklahoma and Texas plans, developed by the Central States Regional Air Partnership, EPA's actions will result in a 0.45 dv improvement from the Texas plan, and a 0.62 dv improvement when measured by from recent conditions. Given the long-term goal of improving approximately 10 dv over 60 years, these are EPA's action makes a substantial difference in attaining the national visibility goal.²⁵

In conclusion, EPA appropriately disapproved several elements of the Texas haze plan as well as the reasonable progress goals in the Oklahoma haze plan as failing to satisfy the Act's requirements. In terms of costs and benefits, the federal haze plan is a good deal – even a bargain. EPA has approved reasonable progress determinations for other states that cost more and result in comparatively less visibility improvement. The rule will pay dividends not only by reducing haze but also by improving public health and the economy.

²⁵ 81 *FR* 323

Responses by Mr. Aaron M. Flynn

**U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Environment**

**Hearing Questions for the Record
The Honorable Lamar Smith (R-TX)**

***Examining EPA's Regional Haze Program: Regulations Without Visible
Benefits***

Mr. Flynn

1. During his testimony, Mr. Bruce Polkowsky stated that differentiating between regulations designed to address public health and regulations to address aesthetics was a "false dichotomy." Do you share this view, and does the Clean Air Act allow public health considerations to provide the basis for regional haze regulatory requirements?

The Clean Air Act contains provisions regarding protection of public health and protection of visibility conditions and other aesthetic issues, and the Act draws clear lines between them. Although either type of provision might result in emission reduction requirements, they are not interchangeable. A requirement imposed pursuant to a provision directed at aesthetics cannot have been designed to address public health concerns and vice versa. Meaning must be given to the directions Congress has enacted into law.

The regional haze program, which is governed by sections 169A and 169B of the Clean Air Act, is limited by statute to addressing visibility impairment in specified National Parks and Wilderness Areas that results from anthropogenic emissions of air pollutants. The factors Congress directed states and, in some cases, EPA to consider when implementing the program's "best available retrofit technology" ("BART") requirements are: the costs of compliance, the energy and non-air quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. Similar factors are considered in determining "reasonable progress" requirements under the program. None of the factors includes public health, and, in a number of rulemaking proceedings, EPA has expressly stated that its actions under the regional haze program are not directed at or based on public health considerations.

Other provisions of the Clean Air Act deal expressly with public health. Most significantly, the Act's National Ambient Air Quality Standards ("NAAQS") provisions found in sections 108 and 109 of the Act require the Agency to establish standards set at the level that is "requisite to protect the public health with an adequate margin of safety." Any action under the regional haze program to require emission reductions, for the purpose of addressing public health, that are in excess of what the NAAQS require would reflect internally inconsistent policy decisions and would violate the statute.

2. Some have suggested that, absent EPA's final regional haze rule for Texas and Oklahoma, sources in Texas would be uncontrolled. Is that accurate or would other Clean Air Act requirements effectively limit their emissions?

The regional haze program is only one of many provisions under the Clean Air Act that can lead to emission control requirements for individual sources. A decision not to impose emission control requirements under that program would not relieve Texas sources from any of their other obligations, such as those under the NAAQS, the Mercury Air Toxics Standards ("MATS"), or the Cross-State Air Pollution Rule ("CSAPR"). None of the fifteen electric generating units that are subject to EPA's regional haze rule for Texas and Oklahoma is uncontrolled. Indeed, eight of those units already have scrubbers, the pollution controls EPA is requiring in that rule, installed, and EPA is now requiring those scrubbers to achieve more stringent emission rates. The remaining units also have significant existing emission controls, including selective non-catalytic reduction systems, low-NOx burners and over-fire air, fabric filter systems, electrostatic precipitator systems, all of which control emissions that can impair visibility, as well as other controls for non-visibility impairing pollutants.

3. Can the human eye truly perceive a single deciview change, and what is the importance of perceptibility as a legal matter under the Clean Air Act?

EPA has asserted in many regional haze rulemaking proceedings that the human eye can perceive a 1.0 deciview change. The best available science, however, casts that assertion into considerable doubt. A 1994 study, for instance, concluded that a change within the range of 1.0 to 2.0 deciviews was necessary for human perceptibility, suggesting that the 1.0 threshold EPA has established is unsupported. M. Pitchford and W. Malm, Development and Applications of a Standard Visual Index, *Atmospheric Environment*, Vol. 28, pp. 1049-1054 (1994). More recent science confirms that at least a 1.8 deciview change is necessary for human perception. Ronald C. Henry, Just-Noticeable Differences in Atmospheric Haze, *Journal of the Air & Waste Management Association*, Vol. 52, pp. 1238-1243 (2002).

Human perception is the cornerstone of the regional haze program. Absent reference to humanly perceptible visibility impacts, there is no meaningful way to weigh the cost of installing and operating various control technologies against the visibility improvements projected to result from their use. The D.C. Circuit, in *American Corn Growers Association v. EPA*, 291 F.3d 1, 7 (D.C. Cir. 2002), confirmed that perceptibility was a key element of the regional haze program and an appropriate driver of regulatory decision-making. The court invalidated EPA's rules that attempted to constrain state evaluation of visibility impacts because "[u]nder EPA's take on the statute, it is ... entirely possible that a source may be forced to spend millions of dollars for new technology that will have no appreciable effect on the haze in any Class I area." Indeed, in promulgating the BART rules, EPA itself selected the deciview as the preferred unit for measuring visibility impairment, precisely because EPA believed the deciview system was linked to human perception.

EPA's decision to dismiss the importance of human perceptibility in many of its regional haze rulemakings is, for those reasons, contrary to D.C. Circuit case law and the Agency's own regulations.

4. Your testimony states that EPA has used purported flaws in state cost analyses and visibility modeling as excuses for disapproving state regional haze plans. Can you explain why EPA has not had a valid legal basis for disapproving state plans on those grounds?

Frequently the two key factors for determining whether emission controls are required as BART or to achieve reasonable progress are costs and visibility impacts. EPA has repeatedly rejected state cost assessments, most frequently on the grounds that those

assessments purportedly do not comply with EPA's Control Cost Manual. The Manual itself is not a binding regulation and EPA regional haze rules make clear that it is only one of many acceptable methodologies for states to use in assessing costs. EPA's rules expressly state: "We believe that the Control Cost Manual provides a good reference tool for cost calculations, but if there are [cost] elements or sources that are not addressed by the Control Cost Manual or there are additional cost methods that could be used, we believe that these could serve as useful supplemental information." 70 Fed. Reg. 39,104, 39,127 (July 6 2005). The rules also state that site-specific considerations affecting costs that might not be addressed by the Manual must be taken into account. Failure to do so will invariably result in unnecessary and sometimes impossible emission control requirements. Nevertheless, EPA has repeatedly disregarded these clear regulatory provisions and refused to allow states the broad discretion to which they are entitled.

EPA's rules also make clear that states have broad discretion in the manner in which they assess visibility impacts. They state, for instance, that "[b]ecause each Class I area is unique, we believe States should have flexibility to assess visibility improvements due to BART controls by one or more methods, or by a combination of methods" and that "States may develop other methods [for evaluating visibility impacts] as well." 70 Fed. Reg. at 39,129-30. The rules also note that one acceptable methodology for evaluating visibility is to model visibility impacts at the area that is most impacted by the source's emissions and that modeling for other impacted areas is not necessarily required. EPA has repeatedly ignored these provisions and disapproved state regional haze plans that have relied on the use of this "most impacted area" methodology. EPA has instead, repeatedly insisted that visibility impacts be assessed on a cumulative basis, where small impacts at all impacted areas are added to together, giving the appearance of large deciview improvements from the use of emission control technologies that are fictional. In other instances, where states have evaluated impacts at multiple affected areas, EPA has disapproved that sort of visibility assessment for failure to adequately consider impacts at the most affected area. In short, EPA has been given a free hand to interpret its regulations to allow the Agency broad discretion to disapprove state plans that appear to comply with all the requirements of the rules.

5. Are you aware of any examples where EPA has agreed to a deadline for acting on a regional haze state implementation plan where that deadline has improperly driven EPA to disapprove that state plan?

There may be many instances where negotiated deadlines have affected EPA's action on regional haze state implementation plans ("SIP"). The clearest example of a deadline driving EPA to reject a state plan of which I am aware occurred with respect to New Mexico's regional haze SIP. Like many other states and for a number of reasons many of which were beyond the states' control, New Mexico was late submitting its SIP to EPA. Before New Mexico submitted its SIP, EPA agreed to a consent decree deadline with WildEarth Guardians establishing an August 5, 2011 deadline for EPA to take action to address visibility requirements for New Mexico. When EPA received New Mexico's SIP on July 5, 2011, instead of renegotiating the consent decree deadline, as EPA did with respect to many other deadlines for action on the SIPs of federal implementation plans ("FIPs") of other states, EPA issued a final FIP for New Mexico and took no action on the state's very different SIP.

6. If recent federal court decisions have shifted away from previously recognized state primacy under the regional haze program, what actions might be necessary for a return to the Act's original intent of state primacy?

There are likely several paths for correcting course with respect to the regional haze program. The Administration is currently engaged in the revision of the regional haze rules and the preparation of guidance to govern the second planning period of the regional haze program. A shift in policy by EPA to more closely adhere to the original intent of the program and reflection of that policy shift in these new regulations and guidance documents would clearly help to resolve the problems that developed during the first planning period. If the new regulations and guidance documents do not reflect an appropriate shift in policy, it may be possible to challenge the new rules and actions taken pursuant to EPA guidance in the D.C. Circuit, where broad state discretion has been properly recognized and potentially in other courts that have yet to rule on regional haze issues. Absent those actions, congressional intervention to reemphasize state authority and to rebalance the apportionment of discretion among the states and the federal government will be required.

**U.S. HOUSE OF REPRESENTATIVES COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Environment**

**Hearing Questions for the Record
The Honorable Jim Bridenstine (R-OK)**

***Examining EPA's Regional Haze Program: Regulations Without Visible
Benefits***

Mr. Flynn

1. During the hearing, the Minority witness in his testimony stated: "And one comment I have about the number of FIPs. In 1984, I had to issue 35 FIPs for visibility protection for the 1980 rule, so there is precedent in looking at when a new series of programs is required for the EPA to look state by state." How are these FIPs from the 1980s different from the FIPs being discussed today? Is his statement taking some liberty about there being some "precedent"? Please explain.

This statement appears to be a reference to the FIPs that EPA promulgated for 29 states in 1987 to implement the requirements of the Agency's Phase 1 visibility rules addressing "reasonably attributable visibility impairment" and protection of "integral vistas." 52 Fed. Reg. 4132 (Nov. 24 1987). It is important to note that these FIPs did not purport to address regional haze and were not promulgated pursuant that requirement of the Clean Air Act. These FIPs were also fundamentally different from the FIPs EPA has promulgated under the regional haze program in terms of the kinds of requirements they imposed. For 28 of the 29 states covered by these FIPs, EPA determined that no control strategies were necessary. The FIPs did little more than provide a framework for future review of strategies to address visibility impairment. The only state for which control strategies were not deemed unnecessary was the state of Maine. There, based on a recommendation from the Roosevelt Campobello International Park Commission, identified the view located outside that Park as an integral vista, and even as to that state, EPA deferred action as to the necessity of a control strategy.

The FIPs promulgated pursuant to the regional haze program are fundamentally different for two primary reasons. First, the 29 states for which FIPs were promulgated failed to submit SIPs to EPA. The majority of the FIPs that EPA has promulgated pursuant to the regional haze program displaced approvable SIPs that the states submitted but that EPA deemed insufficiently stringent. Second, the FIPs EPA has imposed pursuant to the regional haze program have required sources to install the most expensive emission controls, operated to achieve some of the most stringent emission rates on record, based on questionable projections of often minimal visibility impacts. The FIPs issued in 1987 and the FIPs that have been issued during the first planning period of the regional haze program are not comparable.

2. Under statute, what role are states supposed to play in the Regional Haze Program, and what is the role of EPA? Is EPA eroding states' role? Do states enjoy the flexibility that Congress intended them under the Regional Haze Program when EPA just imposes a FIP?

The Clean Air Act assigns to the states "primary responsibility" for regulating air pollution sources. CAA §§ 101(a)(3), 107(a), 42 U.S.C. §§ 7401(a)(3), 7407(a). Congress confirmed

and emphasized the primacy of the states' role when it enacted the CAA's visibility provisions. So long as the states consider the statutorily required factors when developing BART or reasonable progress requirements, EPA has no authority to second-guess their determinations. EPA is limited to the role of ensuring that the states have submitted SIPs that complied with the Clean Air Act's basic requirements.

Instead of fulfilling that role, EPA has repeatedly questioned the wisdom of policy decisions committed to state discretion under the Act, and overruled those decisions whenever EPA has had an alternative policy preference. This is not the role that Congress intended EPA to play when it enacted the statutory provisions creating the regional haze program. Instead of ensuring that states have the flexibility to enact policies that meet their specific needs, based on an assessment of highly subjective factors, EPA has pursued a policy of imposing remarkably uniform emission control requirements on sources throughout the nation despite state opposition and considerable state efforts to develop well-reasoned and well-supported regional haze SIPs that complied with EPA guidance and regulations. EPA's approach is fundamentally at odds with the congressional intent behind the regional haze program.

3. Can you explain how the Regional Haze Program is different from ozone or other air standards? Are costs allowed to be considered under the Regional Haze Program?

Regional haze regulations are different from other Clean Air Act requirements, like the NAAQS for ozone, in several critical ways. First, the NAAQS are intended to address public health and, as a result, should typically be considered to be more stringent than requirements intended to protect fleeting aesthetic concerns, like visibility impairment. Further, because the most significant component of the regional haze program during the first planning period has been the Act's BART requirement, which applies to older sources that began operating between August 7 1966 and August 7, 1977, it has generally been assumed that BART requirements would not impose the most stringent controls and emission rates because retrofit facilities generally cannot achieve the same levels of emission reductions as newer facilities.

Second, the Supreme Court has held that costs of implementation cannot be considered when setting the level of the NAAQS. Under the regional haze program, costs of compliance is a specified statutory factor that must be considered when determining appropriate BART or reasonable progress control requirements.

Finally, the Clean Air Act assigns the role of setting the level of the NAAQS to EPA directly. States are empowered to develop plans to attain the standard EPA establishes, but EPA is not required to defer to state decision-making with respect to setting the standards themselves. Under the regional haze program, on the other hand, the Act assigned states the role of weighing the BART and reasonable progress factors and determining appropriate requirements. Although EPA has often done so, the Act does not empower EPA to question the wisdom of a State's choices of emission limitations if those choices satisfy the basic requirements of the Clean Air Act.

4. Did Congress intend that states achieve emissions limits or other EPA-set milestones under the Regional Haze Program, or do states have more flexibility on implementing visibility improvements?

As stated in section 169A of the Clean Air Act, Congress intended EPA to provide “guidelines” to the state on “appropriate techniques and methods” for implementing the regional haze program. Congress also intended EPA to promulgate regulations requiring state to develop SIPs that “contain such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal” specified by Congress. EPA regional haze rules, at least facially, appear largely confined to that role of guiding state plan development.

States, on the other hand, are empowered by the Clean Air Act to develop visibility policy within their borders and are charged with weighing and assessing the BART and reasonable progress factors. They are also empowered to exercise broad discretion in deciding what requirements to impose. EPA is decidedly not authorized to impose emission limits or other milestones that states must adopt. Indeed, the rules appear to recognize this in many ways. For instance, EPA has established by rule what it calls the “uniform rate of progress,” or the rate of emission reductions that would be needed to meet the statutory goal of the elimination of all visibility impairment in specified National Parks and Wilderness Areas resulting from man-made air pollution by the year 2064. Notably, the national goal itself is just that, a goal. It is not binding. Moreover, the target date of 2064 is only found in EPA’s rules and is not mandated by statute. Further, even EPA’s rules recognize that states are free to deviate from the uniform rate of progress if they determine that meeting that rate is unreasonable. Under the statute and the rules, states are granted broad flexibility. EPA’s implementation of the program during the first planning period has in many instances disregarded congressional intent in that regard.

5. Does the Clean Air Act provide a means for states to work together figure out visibility improvements under the Regional Haze Program? Is EPA respecting that process?

The Clean Air Act and EPA’s regional haze rules provide for regional planning organizations (“RPOs”), which are entities established by states to conduct modeling and technical analyses and to provide a forum for states to work together in assessing their contribution to visibility impairment beyond their borders and developing emission control requirements that reflect appropriate interstate commitments to address visibility-impairing air pollution jointly. EPA’s rules allow states to satisfy a number of analytical requirements by relying on the technical assessments performed by the RPOs. 40 C.F.R. § 51.308(d)(3)(ii). Throughout the first planning period of the program, EPA has largely abided by those provisions of its rules, and almost all states have relied successfully on RPO analyses. EPA’s controversial rule for Texas and Oklahoma, however, discards that approach and instead imposes a requirement that states go beyond RPO analysis when those analyses are, in EPA’s opinion, somehow deficient. Far from providing or suggesting that emission control measures agreed on through the RPO process are merely a starting point for analysis, the regional haze rule equates adoption of all measures agreed on through the RPO process to the demonstration that a SIP contains all necessary measures. EPA’s new position is contrary to its rules.

6. Does the Clean Air Act give EPA the authority to second-guess states' choices in the Regional Haze Program when their plans meet statutory requirements?

The Clean Air Act assigned primary responsibility for all substantive decision-making under the regional haze program to the states. States are tasked with weighing the BART and reasonable progress factors. They are tasked with developing the technical analyses to support their obligation to undertake the BART and reasonable progress assessments and are largely responsible for developing the methodologies they will use in those assessments. And ultimately, states are assigned by law the role of making final determinations under the program and are afforded broad discretion when doing so.

In reviewing any SIP developed under the Clean Air Act, EPA must defer to the state's choices in implementing the Act's requirements: "The Act gives the Agency no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the standards of [CAA] § 110(a)(2), and the Agency may devise and promulgate a specific plan of its own only if a State fails to submit an implementation plan which satisfies those standards." *Train v. Natural Res. Def. Council*, 421 U.S. 60, 79 (1975) (citing CAA § 110(c), 42 U.S.C. § 7410(c)). That deference to state decision-making is at its height under the regional haze program. As stated by the D.C. Circuit in *American Corn Growers Association v. EPA*, 291 F.3d at 8, CAA § 169A "giv[es] the states broad authority over BART determinations" and EPA cannot second-guess those (and other determinations under the regional haze program) as long as the state has considered the applicable statutory and regulatory factors.

7. Is it enough if a state reasonably uses its discretion in the Regional Haze Program and adequately explains it "reasonable progress goal" in its state plan? Can EPA require its own goals if the Agency thinks its analysis is more reasonable?

As with BART determinations, states have broad discretion to establish reasonable progress goals. Indeed, EPA's "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program" (June 1, 2007), provides that the regional haze rule "gives States wide latitude" to determine which measures to require pursuant to the Act's reasonable progress provisions and provides that states "have considerable flexibility" in deciding how to take the reasonable progress factors into consideration, *id.* at 4-2; *see also id.* at 5-1 ("In determining reasonable progress, CAA §169A(g)(1) requires States to take into consideration a number of factors. However, you [*i.e.*, states] have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant.") (emphasis added). EPA cannot lawfully disregard state discretion to determine reasonable progress goals, and it cannot substitute its preferred policy decisions for those of the state absent a failure by a state to comply with the Clean Air Act's basic requirements.

Appendix II

ADDITIONAL MATERIAL FOR THE RECORD

DOCUMENTS SUBMITTED BY CHAIRMAN LAMAR S. SMITH



August 7, 2015

U.S. Environmental Protection Agency
 Attention: Docket ID No. EPA-R06-OAR-2015-0189
 Mr. Guy Donaldson
 Chief Air Planning Section (6PD-L)
 1445 Ross Avenue, Suite 1200
 Dallas, TX 75202-2733

Re: Approval and Promulgation of Implementation Plans; Arkansas; Regional Haze and
 Interstate Visibility Transport Federal Implementation Plan, Proposed Rule, Docket ID
 No. EPA-R06-OAR-2015-0189, FRL-9924-85-Region-6

Dear Mr. Donaldson:

The American Chemistry Council, American Coke and Coal Chemicals Institute, American Farm Bureau Federation, American Forest & Paper Association, American Iron and Steel Institute, American Petroleum Institute, American Public Power Association, American Wood Council, Arkansas Asphalt Pavement Association, Arkansas State Chamber of Commerce, Arkansas Environmental Federation, Arkansas Farm Bureau, Arkansas Forest & Paper Council, Arkansas Ready Mixed Concrete Association, Associated Industries of Arkansas, Inc., Brick Industry Association, Corn Refiners Association, Council of Industrial Boiler Owners, Electricity Consumers Resources Council, Gas Processors Association, Industrial Energy Consumers of America, National Association of Manufacturers, National Mining Association, National Oilseed Processors Association, and U.S. Chamber of Commerce (collectively, "the

Associations”)¹ appreciate the opportunity to submit the following comments in response to the Environmental Protection Agency’s (“EPA’s”) proposed approval of the Arkansas regional haze federal implementation plan (“proposed rule”).

INTRODUCTION

The Associations represent the nation’s leading energy and manufacturing sectors that form the backbone of the nation’s industrial ability to grow our economy and provide jobs in an environmentally sustainable and energy efficient manner. The Associations’ members include electric utilities, manufacturers and energy developers that own or operate facilities directly impacted, or could be directly impacted, by the Regional Haze program. In addition to generating electricity, many member companies require reliable and affordable electricity for manufacturing and industry. The Associations are key and necessary stakeholders in any regulation that directly impacts energy providers and which may impact manufacturers directly or indirectly in the future.

As discussed in more detail below, the Associations urge EPA to withdraw and modify the proposed rulemaking due to numerous deficiencies within it. These deficiencies began with the disapproval of Arkansas’ proposed state implementation plan. The Associations believe that EPA is failing to provide the deference due to states that Congress intended when it passed the Regional Haze statute. This has resulted in too many instances where EPA disapproves reasonable state policy determinations and imposes its own policy preferences through a federal implementation plan. Key among these flawed policy preferences are EPA’s imposition of costly pollution controls at Independence Steam Electric Station (“Independence plant”), a source not eligible for Best Available Retrofit Technology (“BART”) review under the Clean Air Act, without any rational basis, and multiple errors in the White Bluff Electric Power Plant BART analysis. Beyond these specific issues, what most concerns the Associations is that the proposed rule evinces a tendency by EPA to deviate from the Clean Air Act, its own regulations, and guidance to require exorbitant pollution controls that would achieve, at most, negligible visibility benefits. The Clean Air Act’s Regional Haze program envisions gradual improvements to Class I area visibility over long periods of time and through cost-effective means. Contrary to EPA’s rationale in the proposed rulemaking, it is not a vehicle to further accelerate the retirement of coal-fired power plants. Lastly, the Associations object to EPA justifying additional emission control measures on modeled visibility improvements that are less than CALPUFF’s margin of error. To do so means that EPA has no credible evidence showing that visibility improvements would be greater than zero. Such justifications have already been struck down by the U.S. Court of Appeals for the Ninth Circuit and the Associations object to EPA ignoring that court’s determination in deciding whether additional emission reductions at stationary sources would provide any visibility improvements at Class I areas.

¹ A description of each Association is included in Appendix A.

The Regional Haze Program and EPA's Treatment of State Implementation Plans

In recognition of diminished visibility at national parks and other scenic areas, Congress enacted the Clean Air Act's regional haze provisions with a long-term goal of improving the state of visibility. Regional haze is the "impairment of visual range or coloration caused by emissions of air pollution produced by numerous sources and activities, located across a broad regional area." 77 Fed. Reg. 30,248, 30,249 (May 22, 2012). Congress first adopted regional haze provisions in 1977 to address haze issues in national parks and other federal "Class I areas" by adding Section 169A to the Clean Air Act. *See* 42 U.S.C. § 7491.

At the same time, however, Congress realized such changes could not be fully realized rapidly and adopted an approach by which States would make incremental improvements over time. Section 169A requires EPA to "promulgate regulations to assure ... reasonable progress toward meeting the national goal" of visibility. 42 U.S.C. § 7491(a)(4). EPA has established three primary components for a State's regional haze implementation plan: (1) reasonable progress goals ("RPGs") for Class I areas in the State; (2) a long-term strategy; and (3) implementation of BART for certain stationary sources. Through this program, each state charts a "Glidepath" towards natural visibility at the Class I areas within their borders by 2064. States then are provided significant flexibility in crafting the emission reductions necessary for meeting that Glidepath by assessing reasonable progress goals at regular planning period intervals. Reasonable progress goals are therefore "interim goals that represent incremental visibility improvement over time." EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* (June 1, 2007) ("RPG Guidance") at 1-2.

Due to the array of options to meet these goals, and the co-benefits of reducing visibility impairments through other Clean Air Act programs, Congress intended states to have extraordinary flexibility in determining how they meet reasonable progress goals. *See North Dakota v. EPA*, 730 F.3d 750, 768 (8th Cir. 2013) (the Regional Haze program "requires only that a state establish reasonable progress, not the most reasonable progress."). Reasonable progress goals for Class I areas are based on four factors: (1) "costs of compliance;" (2) "the time necessary for compliance;" (3) "the energy and nonair quality environmental impacts of compliance;" and (4) "the remaining useful life of any potentially affected sources." 42 U.S.C. § 7491(g)(1). States are not obliged to reduce emissions from any type of source in particular and EPA acknowledges that states may not need *any* additional emission reductions for some planning periods. *See* EPA, *Additional Regional Haze Questions*, at 9 (Sept. 26, 2009) ("Reasonable progress is not required to be demonstrated on a source-by-source basis."); RPG Guidance at 4-1 ("Given the significant emissions reductions that we anticipate to result from BART" and other Clean Air Act programs "it may be all that is necessary to achieve reasonable progress in the first planning period for some States."). Through the state's consideration of these factors, each Class I area need only make incremental progress through reasonable, cost-effective means.

Perhaps more than any other program under the Clean Air Act, the Regional Haze program provides states with the leading role in exercising their discretion regarding how they meet reasonable progress goals for the Class I areas within their borders. Despite Congress' intention for states to have primary responsibility in implementing the program within their borders, EPA arbitrarily disapproved Arkansas' Regional Haze State Implementation Plan in 2012, 77 Fed. Reg. 14,604 (Mar. 12, 2012), and issued the proposed rule as a federal regional haze implemental plan in its place.

Beyond the strict violations of the Clean Air Act in EPA's approach described below, the Associations are concerned this is a further instance in a disturbing trend of EPA disregarding the considerable discretion Congress assigned to states in the Clean Air Act and inappropriately substituting its own judgment in areas that are local in nature, state-specific, and incredibly complex. EPA justifies many of these disapprovals by amorphous demands for "additional analysis," disagreements over modeling details, minor divergences in cost considerations, or simply EPA's opinion that it believes states should have done more than what the Regional Haze program requires. This is not only inconsistent with the specific Clean Air Act provisions, but violates the prominent role Congress assigned to states in the system of cooperative federalism throughout the Act.

Ultimately, states are in the best position to make these determinations, as Congress recognized. Each state invests significant time and resources working with its neighboring states to understand out-of-state influences on visibility impairment and managing its own federal and state programs to enact a careful balancing act. This balancing act carefully considers the expected emission reductions from existing programs, emission reductions through BART, and several other emission reduction options to find the most efficient and affordable means of meeting federal requirements. As EPA has recognized, at least at the outset of the Regional Haze program, Congress intended to "provide States considerable discretion in establishing reasonable progress goals for improving visibility in Class I areas." EPA, *Response to Petition for Reconsideration of Regional Haze Rule 11* (Jan. 10, 2001); RPG Guidance at 4-2 (states have "wide latitude to determine additional control requirements"); *id.* at 5-1 (states "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant"). EPA has acknowledged that, so long as states consider the statutory factors required by the Regional Haze program and "provide a reasoned basis for their decision, EPA will defer to the state" with respect to reasonable progress determinations. 77 Fed. Reg. 40,150, 40,156 (July 6, 2012). Yet, as is becoming increasingly common and problematic, EPA is ignoring this deference under the Regional Haze program.

Fulfilling the role intended by Congress, states have a successful and demonstrated track record in creating the real-world, measured visibility improvements Congress envisioned under the Regional Haze program. It is increasingly troubling that EPA appears eager to disapprove state implementation plans in order to substitute its own judgment on matters affecting not just

technical details, but state regulatory and economic concerns. EPA's intrusion into these areas has frequently led to costly and unnecessary burdens on state industries while failing to deliver any demonstrable visibility improvements to Class I areas over what states would have achieved. In most instances, EPA's stated rationale for imposing millions (or billions) of dollars in additional costs yield visibility improvements that cannot be perceived by the human eye. EPA's pattern of second-guessing the reasoned decisions of expert state agencies is not only economically wasteful, but it contravenes the state primacy that is the Regional Haze program's core characteristic.

For these reasons, the Associations urge EPA to reset its approach to Regional Haze and respect the primacy role that Congress assigned to the states in determining the best path of reasonable progress taking into account unique local circumstances to realize visibility improvements. EPA has failed to demonstrate any rational grounds to supplant its own judgment for Arkansas' and, as described below, lacks the legal authority to impose the proposed controls here.

EPA Proposes to Unlawfully Impose BART Controls on a Non-Eligible Source

The Associations have serious concerns about EPA's overall approach to the regional haze program in Arkansas and the potential impacts to all of the sources identified in EPA's proposal. One example of these concerns is EPA's imposition of expensive and unnecessary BART controls on the Independence plant, which is arbitrary and capricious. In the proposed rulemaking, EPA concedes that the Independence plant is not eligible under the BART program. 80 Fed. Reg. 18,944, 18,991 (Apr. 8, 2015). It further admits that Arkansas' two Class I areas, as well as those Class I areas that are "most significantly impacted by Arkansas sources" would meet the Uniform Rate of Progress established for each Class I area. *Id.* at 18,992. Indeed, Arkansas' five year review report, using the most recent data, show that even without additional stationary source emission controls visibility impairments on the 20% worst days at Arkansas' two Class I areas are decreasing more rapidly than the Glide Path and the RPG. Arkansas Dep't of Env't'l Quality, State Implementation Plan Review for the Five-Year Regional Haze Progress Report (Revised May 2015) at 55-58. Nevertheless, EPA discards its key concessions, and ignores Arkansas' data on reasonable progress, in favor of seeking costly controls on the Independence plant without any demonstration that additional emission reductions are necessary to meet the Class I areas' reasonable progress goals.

Under the Regional Haze program, states establish reasonable progress goals for reducing visibility impairments by a certain amount of deciviews at Class I areas during each planning period. 40 C.F.R. § 51.308(d)(1). These reasonable progress goals are established through an implementation plan. *Id.* § 51.308(d). In determining how to meet these reasonable progress goals, the state must consider projected emission reductions anticipated from existing Clean Air Act programs as well as through BART. RPG Guidance at 4-1. BART is a pollution control evaluation scheme that only applies to "BART-eligible" emission sources, meaning those "in

existence” on August 7, 1977 and which began operation after August 7, 1962. 42 U.S.C. § 7491(b)(2)(A). Facilities constructed after August 7, 1977 are *not* subject to BART.

Emission reductions through BART and other Clean Air Act programs may be all that is necessary for states to meet their reasonable progress goals and they need do nothing further. RPG Guidance at 4-1. *If*, however, states require additional emission reductions to meet Class I reasonable progress goals, *then* they may implement “additional measures that are reasonable” based on a four-part analysis. *Id.* at 4-2. This may be done where it is *necessary* for Class I areas to achieve their reasonable progress goals. See 42 U.S.C. § 7491(b)(2) (implementation plans must “contain such emission limits ... as may be *necessary* to make reasonable progress”) (emphasis added); RPG Guidance at 4-1 (“Given the significant emissions reductions that we anticipate to result from BART” and other Clean Air Act programs “it may be all that is necessary to achieve reasonable progress in the first planning period for some States.”).

A key flaw of the proposed rulemaking is EPA’s disregard of the *if ... then* decision structure established by its own guidance. EPA freely admits that, after considering emission reductions from BART-eligible sources and other Clean Air Act programs, “Arkansas Class I areas and those outside of Arkansas most significantly impacted by Arkansas sources are projected to meet the [Uniform Rate of Progress] for the first planning period.” 80 Fed. Reg. at 18,992. Under EPA’s RPG Guidance, this should mark the end of EPA’s RPG analysis. However, despite its own guidance, the proposed rule continued on to impose unnecessary, costly, and unauthorized controls on the Independence plant – a BART-*ineligible* source – on the grounds that it is somehow reasonable to do so.

EPA’s explanation of “reasonableness,” however, has nothing to do with meeting Class I reasonable progress goals, the critical *if-then* scenario that allows for additional emission reduction measures. According to EPA, it has *carte blanche* discretion to impose controls on any facility for any grounds that it considers to be reasonable. Here, the entirety of EPA’s “reasonableness” explanation appears to be that the Independence plant is a relatively large source of emissions and that controls at the Independence plant would cost the same as at the White Bluff units. *Id.* at 18,991. These considerations of “reasonableness” are completely unmoored from any discussion of achieving reasonable progress goals at either of the Arkansas Class I areas for this planning period. Where Class I areas are projected to meet their reasonable progress goals, nothing in the Clean Air Act authorizes EPA (or a state in the case of a state implementation plan) to impose new control requirements. This prohibits EPA from going further in search of additional emission reductions. See *Motion Picture Ass’n of Amer., Inc. v. FCC*, 309 F.3d 796, 804-805 (D.C. Cir. 2002) (federal agency power is limited by statutory authorization); *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1060 (D.C. Cir. 1995) (courts will not presume a delegation of power where statute is silent on the issue); *Aid Ass’n for Lutherans v. U.S. Postal Service*, 321 F.3d 1166, 1175-1178 (D.C. Cir. 2003) (striking down postal regulations related to the mailing of insurance offers because the “Postal Service ha[d] no congressionally delegated

authority to exclude” certain types of mailings). The Clean Air Act simply does not give EPA or states the authority to impose emission reductions without linking those reductions to the necessity of meeting RPGs.

Even if EPA had some free-floating authority to dictate new controls, it has previously determined that, where mandatory programs (including BART) allow a state to meet reasonable progress goals during the first planning period, it is “reasonable” to determine that no further emission reductions are required. In rebuffing comments by environmental groups demanding that the State of Nevada impose additional emission reductions even though the Jarbidge Wilderness Area was slated to meet its reasonable progress goals, EPA stated:

The [Regional Haze Rules] and EPA’s guidance affords the State considerable flexibility in determining whether additional emission reduction measures are needed to achieve the [Reasonable Progress Goal] in the first planning period. [Nevada] reasonably concluded that the cost of additional controls was not warranted given projected emissions reductions from anthropogenic sources and the fact that the majority of haze at Jarbidge is from natural and out-of-state sources.

77 Fed. Reg. 17,334, 17337 (Mar. 26, 2012). This approach, whereby a state or EPA only imposes reasonable additional controls when “needed” to meet reasonable progress goals, is amply supported by the Clean Air Act and EPA’s Regional Haze guidance. *See* 42 U.S.C. § 7491(b)(2) (implementation plans must “contain such emission limits ... as may be *necessary* to make reasonable progress”) (emphasis added); RPG Guidance at 4-1 (“Given the significant emissions reductions that we anticipate to result from BART” and other Clean Air Act programs “it may be all that is necessary to achieve reasonable progress in the first planning period for some States.”).

For Nevada, EPA found that it was imminently reasonable to forego additional, expensive pollution controls when the reasonable progress goals for a Class I area were already being met. For Arkansas, however, EPA has completely reversed its prior position without any coherent explanation. EPA may not reverse its prior policy positions without providing some reasoned explanation for that reversal. *See, e.g., Dillman v. NTSB*, 588 F.3d 1085, 1089-90 (D.C. Cir. 2009); *California ex rel. Lockyer v. U.S. Dep’t of Agric.*, 459 F. Supp. 874, 904 (N.D. Cal. 2006), *aff’d*, 575 F.3d 999 (9th Cir. 2009) (requiring “new evidence that would lead to a different conclusion”). Instead of adhering to its rationale in Nevada, or explaining why it is changing its position, EPA “focuses on the” non-BART eligible Independence plant for no reason other than it is a relatively large source of emissions. *Id.* at 18,991-992. It does so “even though Arkansas Class I areas and those outside of Arkansas most significantly impacted by Arkansas sources are projected to meet the [Uniform Rate of Progress] for the first planning period.” *Id.* at 18,992. Given EPA’s prior position in Nevada, its concession that the Arkansas

Class I areas will meet their reasonable progress goals should end the inquiry absent some significant concerns about the state being able to meet the Uniform Rate of Progress in future planning periods. With respect to the first planning period, imposing new pollution controls on the Independence plant serves no purpose whatsoever.

Allowing EPA to impose tens of millions of dollars of controls on BART-ineligible sources like the Independence plant, based only on what it claims is “reasonable,” is not only economically wasteful but effectively re-writes the definition of what sources are BART eligible. Under the Regional Haze program, BART controls may be imposed on (1) major stationary sources in 26 listed categories, (2) that existed on August 7, 1977, (3) but were not in operation prior to August 7, 1962, and (4) emit air pollutants “which may reasonably be anticipated to cause or contribute to any impairment of visibility” at Class I areas. 42 U.S.C. § 7491(b)(2)(A); 40 C.F.R. § 51.301. Under the proposed rule, the first three of these statutory and regulatory criteria would be rendered a nullity. According to EPA, it may impose BART controls on any facility (major or minor), regardless of when it was built or when it began operating, so long as EPA determines it to be “reasonable.” See 80 Fed. Reg. at 18,992 (“it would be unreasonable to ignore a source representing more than a third of the State’s SO₂ emissions and a significant portion of NO_x point source emissions.”). As implemented in the proposed rule, EPA has effectively adopted a *presumption* that at least some BART-ineligible sources should be subject to BART unless those pollution controls are cost prohibitive.² Such a presumption effectively ignores the operative statute and re-writes EPA’s own regulations.

Further, EPA adopts this presumption without first finding it necessary to impose additional emission reductions to meet Class I reasonable progress goals. This necessity determination – finding additional emission reductions to meet reasonable progress goal – anchors the “reasonableness” inquiry in the RPG Guidance. EPA claims that imposing tens of millions of dollars in new controls at the Independence plant is “reasonable,” but declines to justify the need to do so. If no further emission reductions are needed to meet Class I reasonable progress goals, then EPA’s “reasonableness” inquiry becomes a free-floating vehicle for EPA to issue pollution control edicts without any goal to accomplish. Imposing BART controls on the Independence plant without the need to meet Class I reasonable progress goals contravenes the

² The Independence plant was apparently singled out by EPA for additional pollution controls while other BART-ineligible emission sources were not. Although the Associations do not believe there were legal or policy justifications for *any* BART-ineligible source to require additional pollution controls, EPA does not provide any explanation for its selective treatment in this case other than the Independence plant being among the top three largest sources in the state. For states attempting to gain EPA’s approval of their own implementation plan, EPA provides no criteria as to how it expects them to treat BART-ineligible sources in the future, or what prevents States from imposing new emission controls on *all* BART-ineligible sources. This is the very definition of arbitrary and capricious decision making.

Clean Air Act, EPA's Regional Haze regulations, EPA's RPG Guidance and is arbitrary and capricious.

EPA Improperly Uses CALPUFF to Justify Emission Reduction Measures

In at least two instances, the proposed Arkansas federal implementation plan FIP imposes emission reduction measures through BART on the grounds that CALPUFF modeling showed that those measures would reduce visibility impairments, yet those improvements are within CALPUFF's margin of error. This means that EPA has no credible demonstration that there would be *any* visibility improvements attributable to those determinations.

BART requires that states (or EPA in the case of a federal implementation plan) consider "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology." 42 U.S.C. § 7491(g)(2). The Ninth Circuit, in *National Parks Conservation Association v. EPA*, Case No. 12-73710, 2015 WL 3559149 at *8 (9th Cir. June 9, 2015), held that an estimated visibility improvement of 0.085 deciviews was less than CALPUFF's margin of error, and thus, EPA had no basis to believe that BART controls in that case could "reasonably be anticipated" to improve visibility. In the proposed rule, EPA imposes emission reduction requirements under BART in situations where CALPUFF predicted very small visibility improvements without completing any site specific analyses to determine if these visibility improvements are within the margin of error. For example, EPA would require the installation of low NO_x burners and overfire air at Flint Creek Unit 1 even though the *highest* modeled visibility improvement was 0.081 dv. Based on the site specific analysis that was completed for Montana in the Ninth Circuit decision for *National Parks and Conservation Association*, this very small visibility improvement may be less than the margin of error. EPA needs to justify that the small visibility improvement is "reasonably anticipated". The Clean Air Act does not require visibility improvements that cannot be reasonably anticipated. Visibility improvements that are less than the margin of error are not "reasonably anticipated" and found to be invalid by the Ninth Circuit in *National Parks Conservation Association*. 80 Fed. Reg. at 18,968. Visibility improvements at other Class I areas were a fraction of this: 0.026 deciviews at Upper Buffalo, 0.024 deciviews at Hercules-Glades, and 0.014 deciviews at Mingo.

Further, EPA's own guidelines establish that a threshold of 1.0 deciviews for when a stationary source "causes" visibility impairments at a Class I area and 0.5 deciview threshold of when a stationary source "contributes" to visibility impairments. 70 Fed. Reg. 39,161 (July 6, 2005). In other words, EPA is imposing costly emission reduction requirements on sources that, even if their emissions were much higher, would not even rise to the level of "contributing to" visibility impairments at the Arkansas Class I areas. EPA cannot rationally hold that emission reductions at these stationary sources would be "reasonably anticipated" to improve visibility at Class I areas when EPA's own modeling shows that they do not even contribute to visibility impairments.

Sensing that infinitesimal visibility improvements (tiny fractions of what the human eye may perceive) cannot justify the imposition of new emission controls, EPA adds these supposed improvements through a “Cumulative Visibility Improvement” metric. In this case, the purported visibility improvements are 0.145 deciviews – just over 1/10th of what a person may perceive. Justifying emission reductions on *cumulative* visibility improvements is arbitrary and capricious, even if the modeled visibility improvements could be believed. In this case, however, where each constituent modeled visibility improvement is below CALPUFF’s margin of error, EPA can have no confidence that visibility will improve at any individual Class I area through new reduction measures. By adding modeled visibility improvements that should individually be treated as zero, EPA arbitrarily attempts to create something out of nothing (and even here the “something” is far below human perception). EPA should abide by the Ninth Circuit’s decision and avoid basing BART determinations on modeled visibility improvements that are within the margin of error. This includes its attempt in this case to avoid the decision’s holding by adding low confidence modeling results in order to artificially exaggerate the impact of emission reduction measures.

CONCLUSION

For the reasons stated above, EPA’s proposal to issue a Regional Haze Federal Implementation Plan for Arkansas is unlawful, arbitrary, and capricious. The Associations urge EPA to withdraw the proposed rule and propose a new rule that is consistent with the Clean Air Act and EPA’s Regional Haze regulations.

The undersigned Associations appreciate the opportunity to comment on this proposal.

American Chemistry Council	Arkansas State Chamber of Commerce
American Coke and Coal Chemicals Institute	Arkansas Environmental Federation
American Farm Bureau Federation	Arkansas Farm Bureau
American Forest & Paper Association	Arkansas Forest and Paper Council
American Iron and Steel Institute	Arkansas Ready Mixed Concrete Association
American Petroleum Institute	Associated Industries of Arkansas, Inc.
American Public Power Association	Brick Industry Association
American Wood Council	Corn Refiners Association
Arkansas Asphalt Pavement Association	Council of Industrial Boiler Owners

Electricity Consumers Resource Council	National Mining Association
Gas Processors Association	National Oilseed Processors Association
Industrial Energy Consumers of America	U.S. Chamber of Commerce
National Association of Manufacturers	

Appendix A

The **American Chemistry Council** (“ACC”) represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a \$770 billion enterprise and a key element of the nation's economy.

The **American Coke and Coal Chemicals Institute** (“ACCCI”), which was founded in 1944, is the international trade association that represents 100% of the U.S. producers of metallurgical coke used for iron and steelmaking, and 100% of the nation’s producers of coal chemicals, who combined have operations in 12 states. It also represents chemical processors, metallurgical coal producers, coal and coke sales agents, and suppliers of equipment, goods and services to the industry.

The **American Farm Bureau Federation** is the nation’s largest general farm organization, representing agricultural producers in all 50 states and Puerto Rico growing commodities in virtually all sectors of agriculture.

The **American Forest & Paper Association** (“AF&PA”) is the national trade association of the paper and wood products industry, which accounts for approximately 4 percent of the total U.S. manufacturing gross domestic product. The industry makes products essential for everyday life from renewable and recyclable resources, producing about \$210 billion in products annually and employing nearly 900,000 men and women with an annual payroll of approximately \$50 billion.

The **American Iron and Steel Institute** (“AISI”) serves as the voice of the North American steel industry in the public policy arena and advances the case for steel in the marketplace as the preferred material of choice. AISI is comprised of 19 member companies, including integrated and electric furnace steelmakers, and approximately 125 associate members who are suppliers to or customers of the steel industry.

The **American Petroleum Institute** (“API”) represents over 625 oil and natural gas companies, leaders of a technology-driven industry that supplies most of America's energy, supports more than 9.8 million jobs and 8 percent of the U.S. economy, and, since 2000, has invested nearly \$2 trillion in U.S. capital projects to advance all forms of energy, including alternatives.

The **American Public Power Association** (“APPA”) is the national service organization for the more than 2,000 not-for-profit, community-owned electric utilities in the U.S. Collectively, these utilities serve more than 48 million Americans in 49 states (all but Hawaii).

The **American Wood Council** (“AWC”) is the voice of North American traditional and engineered wood products, representing over 75% of the industry. From a renewable resource that absorbs and sequesters carbon, the wood products industry makes products that are essential to everyday life and employs approximately 400,000 men and women in family-wage jobs.

The members of the **Arkansas Asphalt Pavement Association** are committed to supporting member companies in providing quality asphalt research and design and improving communication with the public and peer groups. A part of our mission includes being a liaison with government agencies to guide the development and implementation of applicable environmental regulations. Warm mix asphalt technology, the extensive use of recycled asphalt pavement and the use of reclaimed asphalt shingles demonstrates our industries commitment to environmental stewardship.

The **Arkansas Farm Bureau** is a nonprofit, private advocacy organization of more than 190,000 families throughout the state working to improve farm and rural life.

The **Arkansas State Chamber of Commerce** and the **Associated Industries of Arkansas, Inc.** represent over 1200 member businesses, industries, institutions, business associations, local economic developers and local chambers of commerce in Arkansas. Our members are located in all Arkansas counties and include businesses of all sizes and purpose. The AR State Chamber/AIA is the leading advocate for business before state and federal government where we continually seek to create and maintain a thriving business climate.

The **Arkansas Environmental Federation** is a non-profit association based in Little Rock, Arkansas. Our mission is to serve as the voice for industry on environmental issues in Arkansas, educate industry about proposed and final legislation and regulations concerning environmental matters and promote cooperation among industries, conservation associations, municipalities and government agencies.

The **Arkansas Forest & Paper Council** (“AFPC”) is a state trade association of the pulp, paper and wood products manufacturers focused on advocacy on behalf of its member companies. Arkansas’s forest manufacturing sector is responsible for more than 65,000 jobs in the state and \$4.8 billion in GSP in 2010. The paper sector alone is responsible for more than 28,000 jobs and \$2.6 billion in GSP. The paper sector and total forest manufacturing economy pays \$232 and \$406 million annual in state and local taxes.

The **Arkansas Ready Mixed Concrete Association** (“ARMCA”) is a non-profit trade association whose mission is to promote the use of concrete and provide education, information and assistance in producing a quality product.

The **Brick Industry Association** (“BIA”), founded in 1934, is the recognized national authority on clay brick manufacturing and construction, representing approximately 250

manufacturers, distributors, and suppliers that historically provide jobs for 200,000 Americans in 45 states.

The **Corn Refiners Association** ("CRA") is the national association representing the U.S. corn refining (wet milling) industry. CRA and its predecessors have served this important segment of American agribusiness since 1913. Corn refiners manufacture sweeteners, ethanol, starch, bioproducts, corn oil, and feed products from corn components such as starch, oil, protein, and fiber.

The **Council of Industrial Boiler Owners** ("CIBO") is a trade association of industrial boiler owners, architect-engineers, related equipment manufacturers, and University affiliates representing 20 major industrial sectors. CIBO members have facilities in every region of the country and a representative distribution of almost every type of boiler and fuel combination currently in operation. CIBO was formed in 1978 to promote the exchange of information about issues affecting industrial boilers, including energy and environmental equipment, technology, operations, policies, laws and regulations.

The **Gas Processors Association** ("GPA") has served the U.S. energy industry since 1921 as an incorporated non-profit trade association. GPA is composed of 130 corporate members of all sizes that are engaged in the gathering and processing of natural gas into merchantable pipeline gas, commonly referred to in the industry as "midstream activities." Such processing includes the removal of impurities from the raw gas stream produced at the wellhead, as well as the extraction for sale of natural gas liquid products ("NGLs") such as ethane, propane, butane and natural gasoline. GPA members account for more than 90 percent of the NGLs produced in the United States from natural gas processing. Our members also operate hundreds of thousands of miles of domestic gas gathering lines and are involved with storing, transporting, and marketing natural gas and NGLs.

The **Electricity Consumers Resource Council** ("ELCON") is the national association representing large industrial consumers of electricity. ELCON member companies produce a wide range of industrial commodities and consumer goods from virtually every segment of the manufacturing community. ELCON members operate hundreds of major facilities in all regions of the United States. Many ELCON members also cogenerate electricity as a by-product to serving a manufacturing steam requirement.

The **Industrial Energy Consumers of America** ("IECA") is a nonpartisan association of large energy intensive manufacturing companies with \$1.0 trillion in annual sales, over 2,900 facilities nationwide, and more than 1.4 million employees worldwide. It is an organization created to promote the interests of manufacturing companies through advocacy and collaboration for which the availability, use and cost of energy, power or feedstock play a significant role in their ability to compete in domestic and world markets. IECA membership represents a diverse set of

industries including: chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, glass/ceramic, building products, independent oil refining, and cement.

The **National Association of Manufacturers** (“NAM”) is the largest manufacturing association in the United States, representing small and large manufacturers in every industrial sector and in all 50 states. Manufacturing employs nearly 12 million men and women, contributes more than \$1.8 trillion to the U.S. economy annually, has the largest economic impact of any major sector and accounts for two-thirds of private-sector research and development. The NAM is the powerful voice of the manufacturing community and the leading advocate for a policy agenda that helps manufacturers compete in the global economy and create jobs across the United States.

The **National Mining Association** (“NMA”) is a national trade association whose members produce most of America’s coal, metals, and industrial and agricultural minerals. Its membership also includes manufacturers of mining and mineral processing machinery and supplies, transporters, financial and engineering firms, and other businesses involved in the nation’s mining industries. NMA works with Congress and federal and state regulatory officials to provide information and analyses on public policies of concern to its membership, and to promote policies and practices that foster the efficient and environmentally sound development and use of the country’s mineral resources.

The **National Oilseed Processors Association** (“NOPA”) is a national trade association that represents 13 companies engaged in the production of vegetable meals and vegetable oils from oilseeds, including soybeans. NOPA’s member companies process more than 1.6 billion bushels of oilseeds annually at 63 plants in 19 states, including 57 plants which process soybeans.

The **U.S. Chamber of Commerce** (the “Chamber”) is the world’s largest business federation representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations. The Chamber is dedicated to promoting, protecting, and defending America’s free enterprise system.

50 State Survey - Regional Haze Plans & BART

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Alabama	YES	<p>SIP limited approval on 6/28/12. EPA approved this SIP revision to implement the regional haze requirements for Alabama on the basis that this SIP revision, as a whole, strengthens the Alabama SIP. A limited approval results in approval of the entire SIP revision, even if those parts that are deficient and prevent EPA from granting a full approval of the SIP revision.</p> <p>Alabama identified 43 facilities with BART-eligible sources. Alabama found that three of its BART-eligible sources, Solutia-Decatur, International Paper-Courtland, and Escambia Operating Co-Big Escambia Creek, had modeled visibility impacts of more than Alabama's 0.5 deciview threshold for BART exemption. Escambia accepted permit limits to reduce its visibility impacts to below 0.5 deciview. Only Solutia-Decatur and International Paper-Courtland are therefore considered to be subject to BART. Solutia-Decatur has five BART-eligible emissions units that comprise the BART-eligible source. ADEM has concluded that no additional particulate controls would be reasonable for the BART units at Solutia. For Boilers No. 5 and 6, stack tests have shown an overall PM control efficiency for the ESPs to be 98.8 percent. For Boiler 7, the PM control efficiency has been estimated from stack tests as 99 percent. ADEM determined that no additional controls for Boiler 5, Boiler 6, and the coking boilers would be required for the control of NO_x emissions for BART. However, Boiler 7 would be required to meet an emission limit of 0.36 lb NO_x/MMBtu with the installation of a ROFA system or a comparable technology. For the control of SO₂, ADEM has determined BART for Boilers 5 and 6 to be an emissions limit of 1.40 lbs SO₂/MMBtu. Boiler 7, the largest of the emissions units subject to BART, would be required to meet a limitation of 0.47 lb SO₂/MMBtu with the installation of a flue solvent injection (FSI) system or a comparable technology.</p>	N/A	
Alaska	YES	<p>SIP approved on 2/14/13. EPA approved all provisions of Alaska's SIP submission, including the requirements for the calculation of baseline and natural visibility conditions, statewide inventory of visibility-impairing pollutants, BART, Reasonable Progress Goals (RPGs), and Long-Term Strategy (LTS). The State found that SCR is not cost effective at the Healy Unit 1 facility for an 8 year equipment lifetime. Although</p>	N/A	

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STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Arizona	YES	<p>EPA did not agree with the State's use of an 8 year equipment life, the EPA approved the BART limit for NOx of 0.20 lbs/mmBtu based on the installation of SNCR.</p> <p>Original SIP plan was partially approved. After revisions, the SIP was approved 2/27/15. The amendment changed BART requirements for two steam units at the Apache Generating Station.</p> <ul style="list-style-type: none"> Establish a "better than BART" alternative which will result in overall greater visibility improvement than EPA's previous BART determination. Establish enforceable emission limits for nitrogen oxides (NO_x), sulfur dioxide (SO₂), and large particulate matter (PM₁₀). Establish compliance requirements for all three units, and Include a revision to the emission limit for Apache Steam Unit 1 when operated in combined-cycle mode with Gas Turbine 1. 	<p>FIP plan was proposed but withdrew after SIP was revised and approved.</p>	<p>In September 2013, the 9th Circuit denied the state's request to delay installing pollution controls at three large coal power plants in Arizona. Later in December, the D.C. Circuit rejected the state's appeal challenging a court-ordered deadline for plans to reduce haze pollution in the state. Arizona is legally contending the EPA's imposition of a FIP in lieu of its SIP to curb regional haze.</p>
Arkansas	YES	<p>Arkansas's SIP was rejected in August 2014. In 2012, the EPA rejected a revised SIP because it did not include a provision requiring polluters to implement BART. Since this rejection AK has not proposed a revised plan, nor has the EPA proposed one.</p>	<p>Deadline for EPA to issue FIP on December 2015.</p>	<p>In August 2014, the Sierra Club sued the EPA to compel the EPA to accept the SIP or propose a FIP. The State intervened in the suit in Aug 2015.</p>
California	YES	<p>California's SIP was approved 2/27/15. As to BART, California evaluated the required universe of sources for applicability of BART controls. The state found that three sources were eligible for the application of BART controls: Cabrillo Encina Plant, Duke Energy, and Dynegy Moss Landing. After a review of the control technologies in use at these BART eligible plants, California found that BART level controls were already in place at the sources with a potential to impair visibility at Class I areas. The EPA proposed to find that California has conducted a BART evaluation consistent with the requirement in 40 CFR 51.308(e)</p>	<p>N/A</p>	
Colorado	YES	<p>SIP approved on 12/31/12. In lieu of individual BART determinations, the State submitted a BART alternative as allowed by 40 CFR 51.308(e)(2) for three of the subject-to-BART sources: Cherokee Station Unit 4, Pawnee Station Unit 1, and Valmont Station Unit 5. The EPA proposed to approve the BART alternative. For the rest of the subject-to-BART sources, the State provided analyses of SO₂, NO_x, and PM that took into consideration the five factor under the CAA.</p>	<p>N/A</p>	<p>On 2/25/13, WildEarth Guardians and the National Parks Conservation Association (NPCA) challenged the EPA's approval of the Colorado's SIP. WildEarth Guardians challenged EPA's approval of certain BART and reasonable progress determinations and the time by which the Colorado regional haze SIP required emission limits to be met at the certain coal-fired</p>

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STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		EPA reissued final approval on 5/26/15 with respect to the State's BART determination for the Comanche Generating Station (Comanche) near Pueblo, Colorado.		<p>Litigation</p> <p>NPCA filed a petition for review challenging EPA's approval of the NOX emission limits for certain facilities. The EPA settled. Under the settlement, the EPA will file a motion with the 10th Circuit seeking a voluntary remand to EPA of those portions of the Final Rule regarding EPA's approval of the Colorado regional haze SIP relating to Craig Unit 1. The proposed settlement agreement also states that CDPHE intends to submit a proposal to revise its SIP to EPA no later than July 31, 2015, which will include a determination that the NOX BART emission limit for Craig Unit 1 is 0.07 lb/mmBtu, calculated on a 30 boiler-operating-day rolling average, and with a compliance deadline of Aug. 31, 2021. The proposed SIP revision will not alter any emission limit or compliance deadline for Craig Units 2 or 3.</p>
Connecticut	YES	<p>EPA approved the SIP on July 10, 2014. Connecticut chose to demonstrate that programs already developed by the State would provide greater reasonable progress in visibility improvement than source-by-source BART. Only two of the BART-eligible sources in Connecticut have more than a 0.1 dv impact from NOX, and only one source exceeds a 0.2 dv impact; the rest show impacts far less than these levels. It is, of course, possible that a source-specific BART analysis at one or both of these units exceeding 0.1 dv impact would result in a more stringent BART limit at those particular units than apply under Connecticut's alternative program. However, it is also possible that full consideration of the other four factors would lead to less stringent limits than apply under Connecticut's alternative program. Moreover, it is also quite possible (indeed, likely) that full consideration of the five factors would result in less stringent limits at the other five BART-eligible units (with impacts well below 0.1 dv) than apply under Connecticut's alternative program. Most importantly, and central to both Connecticut's and EPA's analyses, it is also very likely that source-by-source BART would result in fewer total emissions reductions (and therefore visibility improvements) than apply under Connecticut's alternative program. Thus, while any one particular source might have higher or lower emissions limits under</p>	N/A	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Delaware	YES	<p>source-by-source BART (as opposed to Connecticut's alternative program), as a whole, the EPA did not agree that source-by-source BART would necessarily result in more stringent controls on the BART-eligible sources (let alone the non-BART-eligible sources) as a group.</p> <p>SIP approved on 5/13/2011. Because of the lack of tools available to estimate emissions and subsequently model VOC and ammonia effects on visibility, and because Delaware is aggressively addressing VOCs through its ozone SIPs, Delaware determined that SO₂, NO_x and PM are the only reasonable contributing visibility impairing pollutants to target under BART. Delaware identified four BART eligible sources (consisting of five emission units). One of the four sources is a steel mill and the other three sources are electric generating units. The three sources in Delaware that the State found to be subject to BART are EGUs. Delaware chose to address the BART requirements for SO₂ and NO_x for these sources through an alternative program that limits emissions from all coal-fired and residual oil-fired electric generating units with a nameplate of 25 MW or greater. As this alternative program does not address PM emissions, Delaware conducted BART analyses for PM for the three sources subject to BART.</p>	N/A	
Florida	YES	<p>On 8/29/13, EPA approved all portions of Florida's SIP. Florida's SIP addressed the 18 reasonable progress units and 11 facilities with BART-eligible electric generating units (EGUs) subject to EPA's Clean Air Interstate Rule. EPA approved SIP submission to remove Florida's reliance on CAIR to satisfy BART and reasonable progress requirements for the State's affected EGUs.</p>	N/A	
Georgia	YES	<p>EPA issued limited approval on 06/28/2012. A limited approval results in approval of the entire SIP revision, even of those parts that are deficient and prevent EPA from granting a full approval of the SIP revision. EPA proposed a limited disapproval of these same SIP revisions because of the deficiencies in the State's regional haze SIP arising from its reliance on Clean Air Interstate Rule (CAIR). The state identified two BART-eligible sources, coal-fired units at Georgia Power - Plant Bowen and units at Interstate Paper. No additional control was reasonable for BART at Georgia Power. As the Interstate Paper, GA EPD concluded that BART for the power boiler at Interstate Paper is a requirement to burn natural gas only. For the other remaining boilers, no</p>	<p>On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.</p>	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		control technology was identified as being technically and economically feasible; therefore, GA EPD concluded that BART for the remaining boilers is no additional controls.		
Hawaii	NO	Hawaii did not propose a plan.	Developed pursuant to national consent decree. Hawaii worked closely with EPA to develop the FIP. Emissions cap set at 3,500 tons per year of SO ₂ from three power plants on the island of Hawaii: Kanoelohua Hill, Shipman and Puna.	
Idaho	YES	On June 22, 2011, the EPA approved Idaho's regional haze SIP, including its BART determination for the TASC facility, located in Nampa, Idaho. On June 29, 2012, the State submitted a regional haze SIP revision, including a new BART determination for the TASC facility that consisted of a stricter emission limit for oxides of nitrogen (NO _x), a stricter emission limit for particulate matter (PM), and an alternative control measure (BART Alternative) to replace the previously approved BART determination and emission limit for sulfur dioxide (SO ₂). The EPA is fully approving this SIP revision.	N/A	
Illinois	YES	EPA approved Illinois' regional haze SIP on July 6, 2012. In its approval, EPA determined that the emission reductions from sources included in the Illinois plan are significantly greater than even conservative definitions of BART applied to BART subject units (77 FR 39945). EPA also addressed whether the Illinois plan, achieving greater emission reductions overall than the application of BART on BART-subject units, can also be expected to achieve greater visibility protection than application of BART on BART-subject units. Given that, in general, the Illinois power plants are substantial distances from any Class I area and given that the averaging in Illinois' plan is only authorized within the somewhat limited region within which each utility's plants are located, EPA determined that a reallocation of emission reductions from one plant to another is unlikely to change the visibility impact of those emission reductions significantly. Consequently, EPA concluded that the significantly greater emission reductions that Illinois required in its regional haze SIP will yield greater progress toward visibility protection as compared to the benefits of a conservative estimate of BART.	N/A	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Indiana	YES	<p>EPA proposed a limited approval of the state's SIP on 1/26/12. Indiana identified the following non-EGUs as subject to BART: Alcoa Inc., ESSROC Cement Corporation, SABIC Innovative Plastics (formerly GE Plastics), and Mittal Steel USA Inc.—Burns Harbor. Indiana did not consider EGUs in its analysis as it decided to rely on these sources' participation in the CAIR to address the BART requirements for SO₂ and NO_x emissions from these sources, and a modeling analysis demonstrated that particulate matter impacts from EGUs at Class I areas were insignificant and did not warrant further control.</p> <p>Indiana further analyzed the four non-EGU facilities to determine which sources are subject to BART. Additional more refined modeling analyses submitted for three of the four non-EGU sources (ESSROC Cement Corporation, SABIC Innovative Plastics, and Mittal Steel USA Inc.—Burns Harbor) showed that they did not contribute significantly to the visibility impairment at any Class I areas, so that these sources may be exempted from the BART requirement under the regional haze rule. Modeling of these facilities indicated that just one source, Alcoa of Warrick County, is subject to BART. The EPA was satisfied with Indiana's alternative strategy for Alcoa. Modeling conducted by Indiana shows that the alternative achieves greater visibility improvement than BART, equal to 75 percent more reduction in deciviews over the baseline. The alternative BART, though it achieves greater reductions in all pollutants (PM₁₀, SO₂, and NO_x), and most notably achieves significantly higher reductions in SO₂ emissions, equal to approximately 21,600 tons more than BART. The resulting emission limits are adopted by Indiana into the Indiana's regional haze SIP submittal, and will be included in the facilities' Part 70 permit for each unit subject to BART.</p>	<p>On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.</p>	
Iowa	YES	<p>EPA finalized a limited approval of Iowa's regional haze SIP on June 26, 2012. EPA finalized a limited disapproval of the Iowa regional haze SIP because of the state's reliance on CAIR to meet certain regional haze requirements, and issued a Federal Implementation Plan (FIP) to address the deficiencies identified in the limited disapproval of Iowa and other states' regional haze plans.</p> <p>Two significant components of Iowa's initial regional haze SIP included Best Available Retrofit Technology (BART) requirements and the state's long-term strategy. A</p>	<p>On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.</p>	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Kansas	YES	combination of federal equivalency determinations and local analyses were used to conclude that no BART-eligible sources in the state were subject to source specific BART limits. The state utilized CAIR to satisfy most BART requirements associated with EGUs and also included participation in CAIR as a component of the state's long-term strategy. Direct particulate matter emissions from EGUs were reviewed separately and found not to cause or contribute to visibility impairment at a Class I area. BART requirements for non-EGU sources were evaluated using a variety of analyses. The weight-of-evidence BART analysis concluded that no non-EGU BART eligible sources were subject to BART.	N/A	
Kentucky	YES	EPA approved Kansas SIP on 8/23/11. For the initial Regional Haze Plan, unit-specific emissions limits were developed for the Kansas Regional Haze SIP for the five electric generating units found to be subject to Best Available Retrofit Technology. These limits were embodied in the form of agreements between the KDHf and the two owners/operators of the five subject-to-BART units, KCP&L and Westar Energy (Westar). The State/Utility agreements were augmented by a separate agreement between federal agencies (Justice and EPA) and Westar, which required Westar to achieve and maintain aggressive emission limits and project scheduling for NOx and SO2.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	
Louisiana	YES	On March 30, 2012, EPA published a rule finalizing a limited approval and a limited disapproval of two revisions to the Kentucky SIP. A limited approval results in approval of the entire SIP revision, even of those parts that are deficient and prevent EPA from granting a full approval of the SIP revision. Part of KY's Regional Haze SIP required: (1) E.ON U.S. Mill Creek Units 3 and 4, proper BART Title V permit emission limits of 64.3 lb/hr and 76.5 lb/hr respectively for H2SO4 in place of a 0.015 lb/mmiltu limit and (2) East Kentucky Power Cooperative (EKPC) Cooper Units 1 and 2, based on March 18, 2009, revised EKPC BART determination modeling a substitution of dry flue gas desulfurization (DFGD) and fabric filtration (FF) emission controls for the wet FGD (WFGD) and wet electrostatic precipitator (WESP) controls.	N/A	On 3/24/15, CAA and Sierra Club sued the EPA for

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STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		Based on this analysis, Louisiana identified 27 facilities for further consideration due to visibility impact above a 0.5 dv contribution threshold. The state identified three sources as subject to BART and the EPA identified an additional one, a fertilizer plant. Louisiana did not submit source-specific BART evaluations for EGUs in its analysis because the state chose to meet BART requirements for EGUs for SO ₂ and NO _x by participation in the CAIR, and because modeling results showed that the PM emissions from EGUs did not warrant further control. The EPA found that the state's RFGs are deficient because certain of Louisiana's BART determinations are not fully approvable. For LTS, the EPA found that the State's LTS satisfies many of the requirements under 40 CFR 51.308(d)(3); but is deficient because a portion of it relies on BART determinations that the EPA disapproved of. The EPA also disapproved of the following: Determination that the Mosaic Fertilizer Uncle Sam Plant is exempt from BART analysis; and BART analyses for ConocoPhillips, Rhodia, and Sid Richardson Carbon Black Plant for its reliance on CAIR.		failing to promulgate a FIP within two years of the EPA's partial disapproval of Louisiana's SIP
Maine	YES	SIP approved on 4/24/12. EPA proposed to approve Maine's BART determinations for several sources and to incorporate the license conditions that implement those determinations into the SIP. In addition, EPA proposed to approve Maine's low sulfur fuel oil legislation, 38 MBSA § 603-A, sub-§ 2(A), and to incorporate this legislation into the Maine SIP. Furthermore, EPA also proposed to approve a Maine state regulation and incorporate it into the SIP: Maine Chapter 150, Control of Emissions from Outdoor Wood Boilers.	N/A	
Maryland	YES	SIP approved on 7/6/12. EPA has determined that the Maryland Regional Haze SIP contains the emission reductions needed to achieve Maryland's share of emission reductions agreed upon through the regional planning process. Furthermore, Maryland's Regional Haze Plan ensures that emissions from the state will not interfere with the reasonable progress goals for neighboring states' Class I area. EPA also approved the BART determinations for sulfur dioxide (SO ₂), nitrogen oxides (NO _x), and particulate matter (PM) for Unit 25 at the NewPage Luke Pulp and Paper Mill located in Allegany County in Luke, Maryland included in the Maryland SIP.	N/A	
Massachusetts	YES	SIP approved on 9/9/13. EPA approved and incorporated by reference into the SIP: (1) Modified Emission Control Plan for General Electric Aviation (2) Massachusetts	N/A	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		310 CMR 7.26(50)-(54) "Outdoor Hydronic Heaters," (3) "Emission Standards for Power Plants," the sections relating to NO _x and SO ₂ ; (4) Amended Emission Control Plan for Mt. Tom Station dated May 15, 2009; (5) Amended Emission Control Plan Approval for Salem Harbor Station dated March 27, 2012; (6) Amended Emission Control Plan Approval for Brayton Point Station dated April 12, 2012; (7) Facility Shutdown of Somerset Power, LLC (8) Massachusetts 310 CMR 7.00 "Definitions," and 310 CMR 7.05 "Fuels All Districts," and (9) Modified Emission Control Plan for Wheelabrator Saugus, Inc.		
Michigan	YES	SIP approved on 12/3/12. EPA proposed to approve Michigan's identification of five non-electric generating unit (non-EGU) sources as having sufficient impact to warrant being subject to emission limits representing BART. The five non-EGU BART-eligible sources included Lafarge Midwest, Inc.; SMC; Escanaba Paper (referenced in the proposed rulemaking as NewPage Paper Company); Smurfit Stone Container Corp.; and Tilden Mining Company. As part of this action, EPA finds that the State's submittal addressed BART for some sources but failed to satisfy BART for two sources, namely St. Marys Cement (SMC) and Escanaba Paper Company (Escanaba Paper). EPA is promulgating a FIP including nitrogen oxide (NO _x) emission limits for these two sources in addition to sulfur dioxide (SO ₂) emission limits for SMC to satisfy these requirements.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP. On 1/15/13, the EPA also finalized a FIP to implement emission limits that represent BART for certain taconite ore processing facilities in Minnesota and Michigan.	
Minnesota	YES	Minnesota submitted to EPA a regional haze SIP on December 30, 2009, a draft supplement to the SIP on January 5, 2012, and a final supplement to the SIP on May 8, 2012. Michigan submitted to EPA a regional haze SIP on November 5, 2010. In previous rulemakings, EPA approved in part the states' regional haze SIPs for addressing most regional haze requirements. However, EPA deferred action on the states' BART determinations for taconite facilities in order to further evaluate the sufficiency of those determinations. On August 15, 2012, EPA proposed to disapprove in part the states' regional haze SIPs with regards to their BART determinations for taconite facilities, while simultaneously proposing to promulgate a FIP. Minnesota is also subject to back-to-back Regional Haze regulations. EPA is claiming authority to regulate Regional Haze twice in succession at the 2,255 megawatt	On 1/15/13, the EPA finalized a FIP to implement emission limits that represent BART for certain taconite ore processing facilities in Minnesota and Michigan.	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		Sherburne County Generating Plant (Sherco) operated by Xcel Energy. On the one hand, EPA claims that the Sherco Plant warrants regulation because it is "reasonably anticipated" to cause visibility impairment at the Boundary Waters Canoe Area (BWCA); on the other, EPA claims that visibility impairment at BWCA is "reasonably attributable" to the Sherco Plant, which merits further regulation.		
Mississippi	YES	On 6/27/12, the EPA finalized a limited approval of the state's revised SIP. A limited approval results in approval of the entire SIP revision, even of those parts that are deficient and prevent EPA from granting a full approval of the SIP revision. This limited approval results in approval of Mississippi's entire regional haze SIP and all its elements. The state relied on the Transport Rule to exempt seven power plants with BART-eligible EGUS from an SO ₂ /NO _x BART analysis. The EPA, however, did not propose to find that participation in the Transport Rule is an alternative to BART in this action nor did EPA reopen discussions on the CAIR provisions as they relate to BART. The state's reliance on the Transport Rule did not affect the Agency's ability to finalize a limited approval of Mississippi's regional haze SIP.	N/A	
Missouri	YES	On 6/26/12, the EPA finalized limited approval of a revision of the state's SIP. EPA is taking a limited approval action because the revisions as a whole strengthen the SIP and because the action is consistent with the court's intention to keep CAIR temporarily in place. The limited approval results in an approval of the entire regional haze submission and all of its elements, preserving the visibility benefits offered by the SIP until CAIR is replaced by the Transport Rule. EPA found that participation in the Transport Rule was an alternative to BART on 12/30/11.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	
Montana	NO	In 2006, the Montana Department of Environmental Quality withdrew its efforts to implement the Regional Haze rule due to the need "to prioritize and redirect scarce resources from secondary welfare programs, such as visibility, to primary public health protection programs. As a result, EPA assumed authority over the state's Regional Haze program.	On Sept. 18, 2012, the EPA promulgated a FIP to address regional haze in the State of Montana. EPA developed this FIP in response to the State's decision in 2006 to not submit a regional haze SIP revision. EPA's plan would impose more than \$17 million in annual compliance costs on two cement plants and a coal-fired power plant.	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation																				
Nebraska	YES	On March 2, 2012, EPA proposed to disapprove part of the state's plan because of alleged "errors and deviations" in Nebraska's cost effectiveness analysis performed to determine sulfur dioxide Regional Haze controls for the coal-fired Gerald Gentlemen Station.	EPA proposed to force Nebraska to participate in the Cross-State Air Pollution Rule.	In July 2011, Nebraska submitted a Regional Haze implementation plan to EPA. Under the terms of a Consent Decree signed with environmental groups, EPA must either approve Nebraska's plan or impose a federal implementation plan by June 15, 2012																				
Nevada	YES	SIP approved except for NOx BART determination for Reid Gardner Generation Station (RGGS). RGGS consists of four coal-fired boilers, three of which are BART-eligible.	FIP proposed changing NOx emission limits and averaging period of 3 coal-fired boilers. <table><tr><th>Unit</th><th>Plan Emission Limit (lb/day/boiler)</th><th>SIP Emission Limit (lb/day/boiler)</th><th>Approved?</th></tr><tr><td>1</td><td>0.20</td><td>12-month rolling</td><td>N</td></tr><tr><td>2</td><td>0.20</td><td>12-month rolling</td><td>N</td></tr><tr><td>3</td><td>0.20</td><td>12-month rolling</td><td>N</td></tr><tr><td>Averaging Period</td><td>12-month rolling</td><td>12-month rolling</td><td>N</td></tr></table>	Unit	Plan Emission Limit (lb/day/boiler)	SIP Emission Limit (lb/day/boiler)	Approved?	1	0.20	12-month rolling	N	2	0.20	12-month rolling	N	3	0.20	12-month rolling	N	Averaging Period	12-month rolling	12-month rolling	N	On July 2014, 9th Circuit denied an environmental group's challenge to the EPA's approval of the Nevada SIP. <ul style="list-style-type: none">http://www.law360.com/articles/558639/9th-circ-nixes-challenge-to-nev-s-epa-approved-air-plan
Unit	Plan Emission Limit (lb/day/boiler)	SIP Emission Limit (lb/day/boiler)	Approved?																					
1	0.20	12-month rolling	N																					
2	0.20	12-month rolling	N																					
3	0.20	12-month rolling	N																					
Averaging Period	12-month rolling	12-month rolling	N																					
New Hampshire	YES	SIP approved on 8/12/12. EPA approved New Hampshire's January 29, 2010 SIP revision and supplemental submittals on January 14, 2011 and August 26, 2011. New Hampshire, working with MANE-VU, found that every MANE-VU State with BART-eligible sources contributes to visibility impairment at one or more Class I areas to a significant degree. For PM, New Hampshire decided to provide some level of flexibility to Merrimack Station which has a source subject to BART (MK2) and a source not subject to BART (MK1). Additionally, the emission limit chosen by New Hampshire also results in a lower emission rate from the combined units than if New Hampshire had only required MK2 to meet the limit suggested by MANE-VU. EPA is also proposing to find that New Hampshire's analyses and conclusions of BART emission limits for SO2 and NO X for units located at the Merrimack Station facility are reasonable. EPA is proposing to find that New Hampshire's determination of PM BART controls for Newington Station is reasonable. ESP is considered the most stringent control technology and EPA assumes that the permit limit set after stack testing will reflect the fullest extent of reductions that the facility can meet with the use of the ESP. While New Hampshire did not require the lowest sulfur content fuel potentially available, EPA believes that New Hampshire's consideration of additional factors, such as the limited availability of 0.3% sulfur No. 6 fuel oil and the limited additional	N/A																					

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STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		improvement in visibility, is reasonable. Finally, while the cost per ton for the installation of SNCR or SCR is likely not cost prohibitive, given the limited visibility improvement projected as compared to the current controls and with the limited use of the unit, EPA is proposing to find that New Hampshire's determination that current controls satisfy NOX BART is reasonable.		
New Jersey	YES	<p>SIP approved on 1/3/12. EPA discovered that two other facilities within the State had units that were BART eligible. These two facilities were not originally identified by New Jersey as BART eligible because the facilities indicated to the state that they planned to shut down. Later the facilities withdrew their requests. The first BART eligible source, Unit 10 at Vineland Municipal Electric Utility's Howard M. Down Station is under a Federal consent decree [13] to either install additional pollution control measures or to permanently shut down by September 1, 2012. On July 1, 2011, Vineland's Director submitted written certification to EPA and New Jersey that Unit 10 will be retired from service by September 1, 2012. The second BART eligible facility is the BL England Generating Station owned by RC Cape May Holding. This facility has three electric generating units that are BART eligible—Units 1, 2 and 3—as well as three support units including a coal handling system that supports the two coal-fired boilers, Units 1 and 2; a natural draft cooling tower that supports the oil fired boiler, Unit 3; and an emergency fire water diesel engine.</p> <p>NJDEP properly determined that Chevron Products, ConocoPhillips Bayway Refinery, and PSEG Hudson Generating Station are subject to BART review. Chevron Products is reducing its annual combustion limit to bring the facility's potential to emit NOX to less than 250 tons per year (tpy) by March 15, 2011, so no pollutants exceed the BART threshold and Chevron Products will not be subject to further BART analyses. The ConocoPhillips Bayway Refinery has NOX, SO2, and PM controls, emission limits, averaging times, and compliance dates in a Federally enforceable consent decree with New Jersey and EPA. Also, the consent decree requires all the BART-qualified process heaters at the Bayway facility to eliminate oil burning, and to only burn refinery fuel gas with hydrogen sulfide (H2S) content less than 162 ppmvd in compliance with NSPS subpart J. New Jersey expects full implementation by June 30, 2011. EPA proposes approval of these BART evaluations since they were based on maximum feasible controls or a multi-factor analysis. PSEG Hudson Generating</p>	N/A	

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STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		Station has two boilers serving electric generating units (E1 and E2) and two coal handling systems (E22 and E23) that are subject to BART review. One boiler is coal-fired (E2) and subject to controls and Federally enforceable emission limits effective December 31, 2010, due to a Federally enforceable consent decree. The other boiler (E1) primarily combusts natural gas but is also permitted to burn No. 6 fuel oil. New Jersey determined that the new selective catalytic reduction (SCR) and existing low NO X burners (LNBs), new flue gas desulfurization (FGD), and new bag house air pollution control systems for oxides of nitrogen (NO X), sulfur dioxide (SO 2) and particulate matter (PM), respectively, for coal-fired boiler E2, and the existing PM controls for the two coal handling systems, are BART. In addition PSEG has submitted an application to modify the Hudson operating permit to include the following more stringent NO X emission limits: 1.0 lb/MMW-hr when burning natural gas and 2.0 lb/MMW-hr when burning No. 6 fuel oil, with a compliance date of May 1, 2015. EPA proposes to approve New Jersey's BART requirements based on the BART determinations discussed above and the respective BART limitations on emissions, source operation and fuel use.		
New Mexico	YES	SIP submitted in July 2011, but the EPA refused to even consider New Mexico's plan. EPA claimed that it had no choice but to disregard the state's Regional Haze controls because it had to rush to meet a September 2011 deadline negotiated with the environmental group WildEarth Guardians—without the involvement of New Mexico state officials—and included in a court-approved Consent Decree. SIP approved 5/12/14. Approved SIP because it addressed BART requirements for Nox for the Public Service of New Mexico (PNM) San Juan Generating Station (SIGS) in San Juan County, New Mexico and the New Mexico Visibility Transport SIP that address impacts of emissions from the SIGS, as required by the Federal Clean Air Act (CAA) mandate to ensure that emissions from sources in New Mexico do not interfere with programs in other states to protect visibility.	On August 22, 2011, EPA proposed a federal plan that requires nearly \$840 million more in capital costs than New Mexico's preferred plan. FIP was later withdrew in light of SIP approval.	New Mexico initially challenged the EPA's refusal to consider its SIP in 2011 in the 10 th Circuit. EPA entered into consent decree with the WildEarth Guardians of August 5, 2011, to have either approved the New Mexico SIP or to have implemented a FIP.
New York	YES	On 8/28/12, the EPA approved seventeen source-specific SIP revisions containing permits for BART. These SIP revisions were submitted to address Clean Air Act requirements and EPA's rules for states to prevent and remedy future and existing anthropogenic impairment of visibility in mandatory Class I areas through a regional	New York's revised SIP did not include final BART permit modifications consistent with the EPA's proposed FIP for certain of the units at Dyreghy's Roseton and Danskammer Generating Stations. Therefore EPA is	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		haze program. Although New York State addressed most of the issues identified in EPA's proposal, EPA is promulgating a FIP to address two sources where EPA is disapproving New York's BART determinations.	disapproving those portions of the SIP and promulgating a FIP addressing the SO ₂ BART requirements and setting emissions limits for Units 1 and 2 of Dynegy's Roseton Generating Station, and addressing the SO ₂ , NO _x and PM BART requirements and setting emissions limits for Unit 4 of Dynegy's Danskammer Generating Station. New York did submit a SIP revision with final BART permit modifications consistent with EPA's proposed FIP with respect to NO _x and PM for Units 1 and 2 at Dynegy's Roseton Generating Station. EPA therefore is not adopting a FIP for the NO _x and PM BART determinations for Roseton Units 1 and 2.	
North Carolina	YES	On 6/7/12, EPA finalized a limited disapproval of SIP for relying on CAIR as being equal or better than BART. On 10/31/14, the State submitted an alternative to source specific BART demonstrations for 6 affected coal-fired EGUs. Five facilities are equipped with NO _x and SO ₂ emission controls in response to emission limits specified in N.C. Clean Smokestack Act. The 6th facility retired its coal burner in December 2013. The EPA found that these alternative measures will achieve greater emissions reduction.	N/A	
North Dakota	YES	On 4/6/12, EPA partially approved revised SIP. EPA disapproved 1. North Dakota's nitrogen oxides (NO _x) BART determinations and emissions limits for Milton R. Young Station (MRY) Units 1 and 2, Leland Olds Station (LOS) Unit 2, and Coal Creek Station (CCS) Units 1 and 2. 2. North Dakota's determination under the reasonable progress requirements found at section 40 CFR 51.308(d)(1) that no additional NO _x emissions controls were warranted at Antelope Valley Station (AVS) Units 1 and 2. 3. North Dakota's reasonable progress goals (RPGs). 4. Portions of North Dakota's longterm strategy (LTS) that relied on or reflected other aspects of the RH SIP that we were proposing to disapprove. EPA is promulgating a FIP to address the gaps in the plan resulting from its partial disapproval of North Dakota's SIP.	The proposed FIP included the following elements: a. NO _x BART determinations and emission limits for MRY's Units 1 and 2 and Leland Olds Station Unit 2. b. NO _x BART determination and emission limit for CCS Units 1 and 2. c. A reasonable progress determination and NO _x emission limit for AVS Units 1 and 2. d. A five-year deadline to meet the emission limits and monitoring, recordkeeping, and reporting requirements for the above seven units to ensure compliance. e. RPGs consistent with the SIP limits proposed for	North Dakota and Great River Energy challenged EPA's disapproval of the state's NO _x BART SIP and EPA's FIP for Coal Creek Station in North Dakota v. EPA, 730 F.3d 750 (8th Cir. 2013). The 8th Circuit held that EPA's disapproval of the state's NO _x BART determination for Coal Creek was justified, concluding that EPA's role in reviewing SIPs was more than ministerial and that EPA had authority to review whether the state's BART assessment was "moored to the CAA's provisions." The court concluded that the SIP's cost assessment was skewed by a substantial and conceded data flaw and that EPA had therefore properly found the SIP inconsistent with the CAA. The court, however, held

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
			<p>approval and proposed FIP limits.</p> <p>f. LTS elements that would reflect the other aspects of the proposed FIP.</p>	<p>that EPA's FIP was inconsistent with CAA requirements because EPA refused to consider, during its own BART assessment, the fact that Coal Creek had installed and was operating a particular type of NOx emission control. The court rejected EPA's arguments that it could permissibly disregard emission controls that were installed voluntarily or that were installed after the "baseline period" against which visibility improvements are judged. The court concluded that, under the BART Guidelines, any installed emission control must be considered.</p>
Ohio	YES	<p>SIP approved on 7/2/12. Ohio's SIP included BART requirements to Ohio's only BART source, P.H. Glatfelter.</p> <p>On April 14, 2014, Ohio submitted a SIP revision letter requesting that the portion of the 2011 Regional Haze SIP that established deadlines for Ohio's only nonEGU BART source, P.H. Glatfelter, be extended.</p>	<p>On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.</p>	
Oklahoma	YES	<p>The EPA partially disapproved a revision to the Oklahoma SIP submitted in February 19, 2010, that addresses regional haze for the first planning period. Specifically, EPA is proposing to disapprove Oklahoma's Reasonable Progress Goals (RPGs) for the Wichita Mountains Class I area. Oklahoma declined to impose the most expensive sulfur dioxide controls on six power plants subject to Regional Haze requirements, because the capital costs—almost \$1.8 billion—were deemed unreasonable. Instead, Oklahoma proposed an alternative plan that would achieve even greater emissions reductions by fuel switching from coal to natural gas.</p> <p>EPA, however, refused to approve Oklahoma's Regional Haze plan, because the agency objected to the state's cost-effectiveness analysis. EPA concluded that the most stringent sulfur dioxide controls were cost-effective and imposed them on December 28, 2011.</p>	<p>EPA is proposing a Federal Implementation Plan (FIP) for each Texas and Oklahoma to remedy certain deficiencies in the SIP. The proposed FIP would implement SO₂ emission limits on fifteen Texas sources as part of a long-term strategy for making reasonable progress at three Class I areas in Texas and Oklahoma, sets new RPGs for the Big Bend, the Guadalupe Mountains, and Wichita Mountains Class I areas, and substitutes Texas' reliance on the Clean Air Interstate Rule (CAIR) to satisfy BART requirements at its EGUs with reliance on CAIR's successor, the Cross-State Air Pollution Rule (CSAPR).</p>	<p>Oklahoma and industry parties sued the EPA in Oklahoma v. EPA, 723 F.3d 1201 (10th Cir. 2013), arguing that the EPA exceeded its authority and disregarded state discretion by disapproving Oklahoma's SIP and adopting a FIP. The 10th Circuit rejected this argument, holding that EPA had "the power to review Oklahoma's BART determination" to ensure it met the CAA's requirements. The court found that Oklahoma had deviated from the BART Guidelines' requirements regarding assessment of compliance costs. This flaw opened the door to EPA's adoption of a FIP, and, even though the court found the challenges to the FIP</p>

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Oregon	YES	EPA approved portions of SIP revision submitted by the State of Oregon on March 8, 2011. EPA is also approving portions of the revision as meeting certain requirements of the regional haze program, including the requirements for BART. SIP submittal includes rules which allow PGE Boardman to either cease burning coal within five years of EPA's approval of the rules or to cease burning coal by December 31, 2020. PGE must notify ODEQ in writing no later than July 1, 2014 if it chooses to cease coal burning within 5 years of this action. If it chooses that option, one set of emission limits apply; however, if it chooses to continue operating until December 31, 2020, more stringent emission limits apply.	N/A	presented "a close case," it deferred to EPA's technical findings in support of its FIP.
Pennsylvania	YES	EPA approved PA's SIP in April 2014 despite admitting that the SIP failed to provide key information on the cumulative impact that emission controls have on air pollution. The SIP found that the state's major polluters should not be subjected to BART requirements.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	In April 2015, environmental group, Earthjustice, sued the EPA challenging its approval of PA's RFP because the plan failed to impose any meaningful controls on emissions. • http://www.law360.com/articles/641561/lack-of-emission-controls-dooms-pa-air-plan-3rd-circ-told
Rhode Island	YES	EPA approved SIP on 5/22/12. EPA is proposing to approve RI DEM's determination that there are no BART-eligible sources in Rhode Island.	N/A	
South Carolina	YES	EPA limited approval of SIP on 6/28/12. South Carolina initially identified 24 facilities with BART-eligible sources. Of the 21 BART-eligible sources, 19 sources demonstrated that they are not subject to BART. The two BART-eligible EGUs in the State, relied on CAIR to satisfy BART for SO ₂ and NO _x for its EGUs in CAIR. EPA approved progress report on 1/27/14. South Carolina's progress report SIP reviews the status of the State's 21 BART-eligible sources, including two sources—SCE&G-Williams and SCE&G-Wateree—found to be subject to BART. The progress report SIP indicates that flue gas desulfurization systems have been installed on	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
South Dakota	YES	these two BART-subject sources and are currently operating. SIP approved on 4/25/12. The SIP required BART to be installed on only the Otter Tail Power Company's Big Stone I Power Plant. BART must be installed as expeditiously as practicable, but no later than 5 years from EPA's approval of the SIP. South Dakota requested that Otter Tail Power Company complete a BART analysis for Big Stone I and used this analysis as a basis for its BART determination for this source for NO _x , SO ₂ and PM. South Dakota determined BART to be the second ranked control option, semi-dry FGD at 90 percent control efficiency in Section 6.3.5.2 of the SIP. Even though the top ranked control option, wet FGD at 95 percent control efficiency, reduced the SO ₂ emissions more than the second ranked option, the State determined that there is no discernible difference between the two options when considering visibility impacts. South Dakota specified BART limits of 505 lb/hour and 0.09 lb/MMBtu (30-day rolling average) that apply at all times including periods of startup, shutdown and malfunction.	N/A	
Tennessee	YES	SIP partially approved on 4/24/12 except for BART determinations for Eastman Chemical Company. On 11/27/12 EPA approved BART determinations for Eastman in revised SIP. The SIP revision (1) Modifies the final compliance date to April 30, 2017, for the original Eastman BART determination; and (2) establishes a BART alternative determination option for Eastman to convert its B-253 Powerhouse (Boilers 25-29) to burn natural gas.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	
Texas	YES	SIP partially approved on 12/16/14. The EPA proposed approval of Texas's BART requirements, but disapproved the SIP revision for not adequately addressing other requirements of the regional haze program related to reasonable progress, the long-term strategy, and the calculation of natural visibility conditions. Also disapproved revisions that addressed requirements of the CAA regarding interference with other states' programs for visibility protection for the 1997 fine particulate matter.	EPA is proposing a Federal Implementation Plan (FIP) for each Texas and Oklahoma to remedy certain deficiencies in the SIP. The proposed FIP would implement SO ₂ emission limits on fifteen Texas sources as part of a long-term strategy for making reasonable progress at three Class I areas in Texas and Oklahoma, sets new RFGs for the Big Bend, the Guadalupe Mountains, and Wichita Mountains Class I areas, and substitutes Texas' reliance on the Clean Air Interstate Rule (CAIR) to satisfy BART	In 2012, Texas sued the EPA after the agency rejected its plan for reducing regional haze, which involves cutting sulfur dioxide emissions. The challenge was based in part on Texas' lawsuit over the Cross-State Air Pollution Rule, which factors into the regional haze plan. The U.S. Supreme Court ruled in 2014 that the Cross-State Air Pollution Rule was legal, so Texas and the EPA are negotiating a resolution to the regional haze lawsuit.

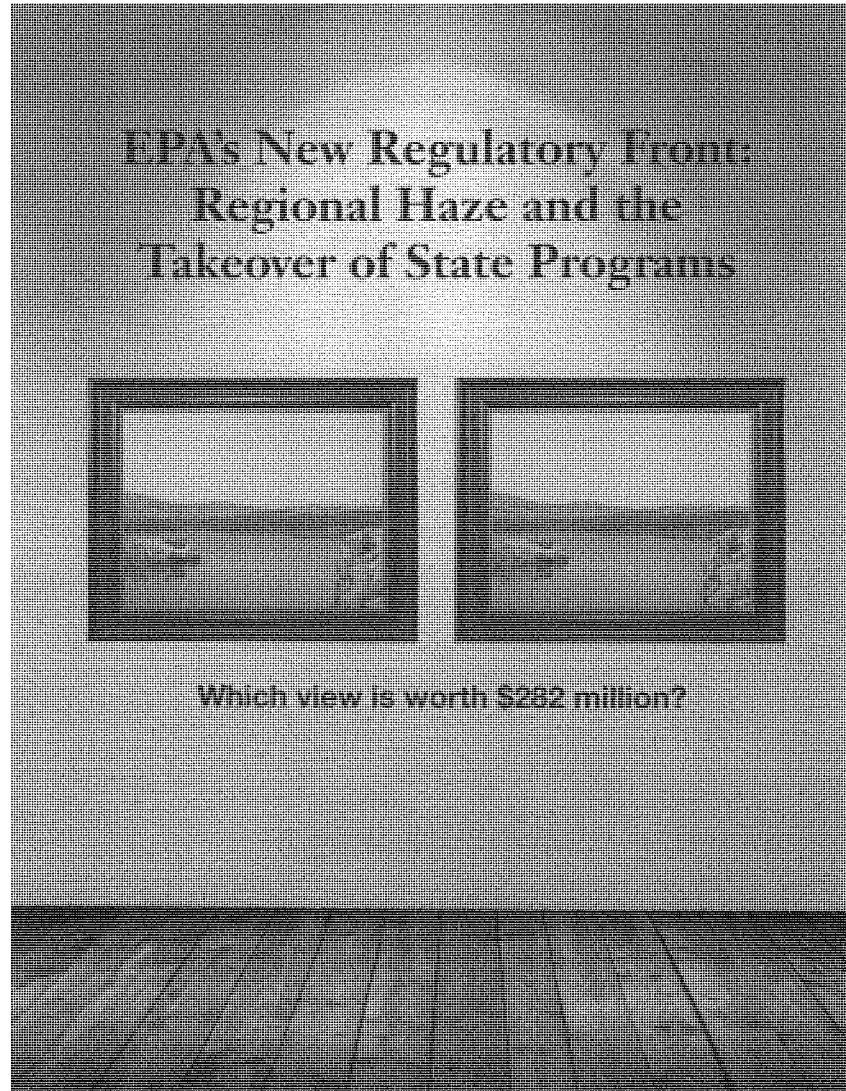
STATE	SIP	SIP / BART Details	FIP Plan	Litigation
Utah	YES	SIP partially approved on 12/14/12. EPA approved all sections of the May 26, 2011 SIP submittal with the exception of the requirements pertaining to nitrogen oxides (NOX) and particulate matter (PM) under BART. EPA disapproved the State's NOX and PM BART determinations and limits in the SIP for four subject-to-BART electric generating units (EGUs). EPA proposed to disapprove these BART determinations because they did not comply with regulations pertaining to factors to be considered as part of a BART determination and also because it did not contain provisions necessary to make BART limits practically enforceable.	N/A	Environmental groups sued the EPA for failure to take timely action with respect to the regional haze requirements of the CAA and the regulations for Utah. The EPA entered into a consent decree that requires that the EPA sign a notice of final rulemaking addressing the regional haze requirements for Utah by October 31, 2012.
Vermont	YES	SIP approved on 5/22/12. EPA proposed to approve Vermont's August 26, 2009 SIP revision, and its supplement, as meeting the applicable implementing regulations found in 40 CFR 51.308. Vermont evaluated the major point sources in the State and determined that none meet the criteria (as described in Section II.D) to be considered BART-eligible. EPA agrees with VT DEC's determination and proposes to find that there are no sources in Vermont which meet the BART eligibility criteria.	N/A	On 2/5/15, CAA and the Wildearth Guardians sued the EPA for failing to promulgate a FIP within two years of disapproving Utah's SIP
Virginia	YES	SIP approved by the EPA on 2/25/14. The EPA approved on the basis that the SIP addresses the progress report and adequacy determination requirements for the first implementation period for regional haze. The progress report SIP included a determination that the Commonwealth's existing regional haze SIP requires no substantive revision to achieve the established regional haze visibility improvement and emissions reduction goals for 2018. EPA found Virginia's progress report SIP adequately reviews the status of Virginia's four BART sources and its reasonable progress determination source by mentioning that controls are currently operational at these sources or that units have been shutdown.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	
Washington	YES	SIP partially approved by EPA on 6/11/14. The EPA approved numerous elements in the SIP including the State's BART determinations for a number of sources. This	N/A	

STATE	SIP	SIP / BART Details	FIP Plan	Litigation
		action also: Disapproves the NOx BART determination and promulgates a Federal BART alternative for five BART emission units at the Tesoro Refining and Marketing refinery (Tesoro refinery) located in Anacortes, Washington; finalizes a limited approval and limited disapproval of the State's SO ₂ BART determination and promulgates a Federal BART alternative for the Intalco Aluminum Corp. potline operation located in Ferndale, Washington; and disapproves the State's BART exemption for the Alcoa Wenatchee Works located in Malaga, Washington, determines that the Wenatchee Works is subject to BART, and promulgates Federal BART for all emission units subject to BART at the facility.		
West Virginia	YES	SIP approved by EPA on 6/5/15. West Virginia's SIP revision addresses requirements of the Clean Air Act (CAA) and EPA's rules that require states to submit periodic reports describing progress towards reasonable progress goals (RPGs). EPA approved the SIP revision on the basis that it addressed the progress report and adequacy determination requirements for the first implementation period for regional haze. Note, the state relied on CAIR to achieve significant reductions in emissions to meet both the BART requirements and to address impacts from West Virginia sources in Class I areas.	On 5/30/12, the EPA finalized FIPs to replace reliance on CAIR with reliance on CSAPR in the state's SIP. The FIPs will immediately substitute the CSAPR program for CAIR in these SIPs. As a result of this action these states would not have to take further action on their regional haze SIPs until 2018 (unless they choose to revise their SIPs accordingly and resubmit them to replace the FIP.	
Wisconsin	YES	SIP approved on 2/28/12. The SIP addressed Clean Air Act (CAA) and Regional Haze Rule (RHR) requirements to remedy any existing and prevent future anthropogenic visibility impairment at mandatory Class I areas, notably including establishing limits requiring BART for the Georgia-Pacific facility in Green Bay.	N/A	
Wyoming	YES	On Jan 2013, SIP Partially disapproved by the EPA, specifically the BART determinations for NOx emissions at 5 generating units.	On Jan 2014, EPA issued a FIP for the five units, requiring the installation of additional pollution controls for NOx emissions by March 2019. Out of the state's 15 coal units subject to regional haze requirements, at least 10 can use NOx emission control technology as deemed appropriate by the state. However, PacifiCorp's Dave Johnston Unit 3 and Wyodak Unit 1, and Basin Electric Laramie River Units 1, 2, and 3 are now required to install new low-NOx burners with overfire air and Selective Catalytic Reduction (SCR) controls. The rule	<p>The agency entered into a consent decree to issue a final regional haze rule for Wyoming by Jan. 10, 2014, after it was sued by environmental groups for its failure to take timely action with respect to the regional haze requirements.</p> <p>On March 2014, the State and two power companies sued the EPA. On Sept 2014, the 10th Circuit stayed the EPA's rejection of part of Wyoming's SIP.</p> <ul style="list-style-type: none"> • http://www.bna.com/epa-haze-controls/

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STATE	SIP	SIP / BART Details	PIP Plan	Litigation
			gives Dave Johnston Unit 3 the option to shut down in 2027 if it chooses not to install SCR controls. EPA estimated capital costs for the controls range from \$16 million (for Dave Johnston, with SCR) to \$188.8 million (for Laramie River Unit 2).	n17179994580/

Sources: Federal Register, States' Regional Haze websites, and EPA.gov.

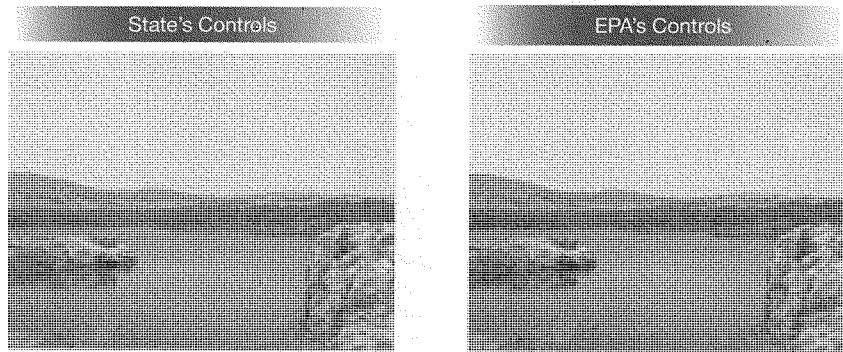




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EPA imposed \$282 million per year in costs to achieve this “improvement” in visibility.



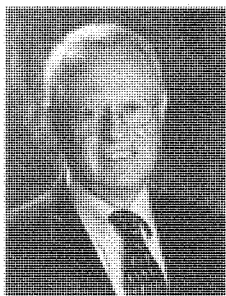
Wichita Mountains Wildlife Refuge, Oklahoma

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Introduction

William L. Kovacs



Regulatory reform is a key component of the U.S. Chamber's 2012 Jobs Agenda. Over the last several years, an avalanche of new economically significant regulations has had an adverse impact on almost every sector of the economy. The permitting system

has become so calcified that the private sector is prevented from investing billions of dollars in new projects because it cannot obtain the environmental permits needed to begin construction. The Chamber's *Project No-Project* study found that in March 2010, 351 proposed new power plant projects were unable to secure permits. These projects alone, if constructed, would have resulted in a direct investment in our economy of \$577 billion and would have created 1.9 million jobs per year during the seven years of construction. The Chamber focused on electric power generation projects for hard data from which to make the analysis; however, we could have chosen oil and gas projects, big box stores, cell towers, pipelines, or almost any project that is in need of construction since all these types of projects are subject to the same difficulties in obtaining permits.

To address this regulatory avalanche and to make the permitting process more efficient and faster, the Chamber supported reforming the rulemaking process and streamlining the permitting process.

While researching this broken regulatory process, the Chamber discovered that many of the new rulemakings and the unreasonable delays in permitting resulted from what appear to be numerous friendly

lawsuits that result in Consent Decrees in which the EPA agrees to bind itself to issue new regulations on a specific timetable; i.e., "We can now tell Congress the court made us do it." This process has been coined "Sue and Settle Rulemaking."

Specifically, Sue and Settle Rulemaking occurs when an organization sues a federal agency to initiate a rulemaking, only to have the agency settle the lawsuit behind closed doors, with no notice to, or input from, the parties affected by the ensuing rulemaking. The only recourse for those affected is to participate in the agency's public comment period *after* the settlement has been agreed to by the agency—in essence, after the damage has been done. Then, after the rule is final, impacted parties can challenge it. This is of little value, though, since the court typically gives great deference to the agency's decision and upholds it unless the party challenging can establish that the agency's action was arbitrary and capricious, a very difficult standard to meet. When questioned about the scope or rationale for the rulemaking by Congress, the agency simply explains that it is bound by a court order to move forward with the regulation. What is missing from the story is the fact that the agency *voluntarily* agreed to the court order.

Sue and Settle Rulemaking is responsible for many of EPA's most controversial, economically significant regulations that have plagued the business community for the past few years: regulations on power plants, refineries, mining operations, cement plants, chemical manufacturers, and a host of other industries. Nevertheless, one of the most successful Sue and Settle strategies has been on an issue few in Washington or around the nation are paying attention to: regional haze requirements under the Clean Air Act.

The Chamber learned about regional haze from our members in North Dakota. The state government

was fighting with the EPA over proposed new haze requirements that arose from a settlement and Consent Decree between EPA and several environmental groups in federal court in Oakland, California. Yes, the implementation of North Dakota's regional haze plan was the subject of a lawsuit brought in Oakland. Neither EPA, nor the environmental groups, nor the court provided North Dakota with notice of the lawsuit or the settlement. It was only after the settlement was announced that the state had a chance to provide input. Worst of all, the new requirements that EPA was insisting on, which came out of this mysterious settlement, were threatening to make power generation in North Dakota so expensive that several power and cement plants were in danger of shutting down.

As the Chamber studied the North Dakota situation, we discovered that the same plaintiffs in that case had filed similar lawsuits against a number of other states across the country. Governors found themselves in the same situation as North Dakota—bound by a federal court-approved settlement and Consent Decree between EPA and environmental groups that impacted their states, and they had no clue of what was happening. Once entered, the Consent Decree allowed EPA to claim that it had no choice but to impose these new federal haze controls as a substitute for the state haze program because of the court order in these states.

While researching the North Dakota situation, the Chamber learned that William Yeatman, an energy policy analyst at the Competitive Enterprise Institute, was conducting similar research on New Mexico and a few other states. The Chamber retained Yeatman to help decipher the nationwide puzzle of lawsuits, Consent Decrees, and regulations that make up EPA's Regional Haze program. What he found is startling: Through Sue and Settle Rulemaking, the plaintiffs have converted a state visibility program for public

parks into a major new set of federal regulations that, if successful, could force existing coal-fired power plants and other industrial facilities to shut down.

The Chamber believes that this issue deserves more attention in Washington. For this reason, we asked Yeatman to write this report and the state one-pagers to help policymakers understand this complex and potentially disastrous set of federal regulations that will take over what Congress clearly determined to be a state environmental responsibility. We look forward to working with Congress to address the many challenges presented by Sue and Settle Rulemaking and EPA's new regional haze regulations.

William L. Kovacs is the U.S. Chamber's senior vice president for Environment, Technology & Regulatory Affairs.

EPA's New Regulatory Front: Regional Haze and the Takeover of State Programs

William Yeatman

Overview

The stated mission of the Environmental Protection Agency (EPA) is to protect human health and the environment.¹ EPA has for the past four years cited this mission as it wages a multi-front battle against fossil fuels, imposing a series of increasingly large, costly regulations designed to limit fossil fuels' extraction, use, emissions, and waste disposal. These regulations, which among other things, seek to reduce hazardous air pollutant emissions, the interstate movement of air pollutants, greenhouse gases, solid waste disposal, and water pollution, have been the focus of intense congressional and public scrutiny. In the end, EPA finalized some regulations, revised some, delayed others, and in a few instances was forced to start over. But the impact of these regulations is unmistakable and has led to—and will continue to—cause early retirement of a long list of energy facilities, chief among them coal-fired power plants.

Despite all the publicity for other regulations, one of EPA's more dubious, and arguably illegal regulatory efforts remains below the radar to many: the Regional Haze rule.

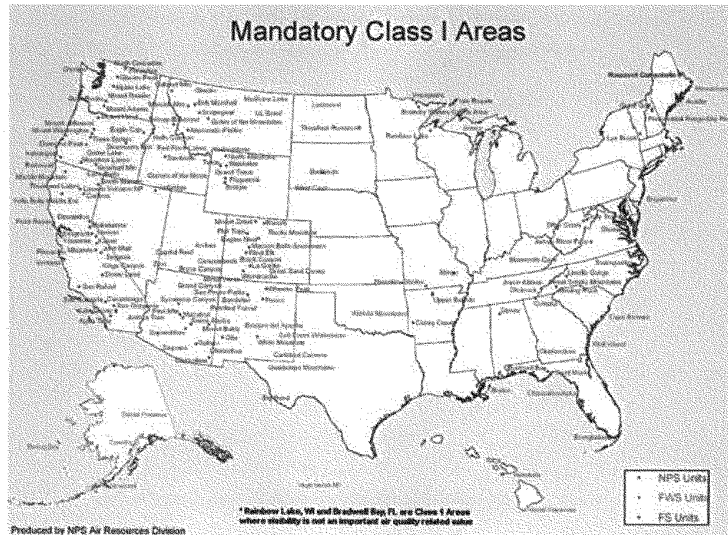
EPA's Regional Haze program, established decades ago by the Clean Air Act, seeks to remedy visibility impairment at federal National Parks and Wilderness Areas. Because Regional Haze is an aesthetic regulation, and not a public health standard, Congress emphasized that states, and not EPA, should be the lead decision makers. However, EPA—with some help from its friends at special interest groups and the controversial "Sue and Settle" Rulemaking process—has devised a loophole to usurp state authority and federally impose a strict new set of emissions controls that cost 10 to 20 times more than the technology the states would otherwise have used. Here's how it works: In five Consent Decrees (see Appendix C) negotiated with environmental groups, EPA has willingly committed itself to deadlines to act on

the states' Regional Haze strategies. On the eve of any given deadline the agency, due to the Consent Decree, determines that it cannot approve a state's strategy to reduce haze due to alleged procedural inadequacies. Then, EPA claims that it has no choice but to impose its preferred controls through a Federal Implementation Plan (FIP) in order to comply with the Consent Decree.

Already, EPA has used this pretextual rationale to impose almost \$375 million in annual costs on six coal-fired power plants in New Mexico, Oklahoma, and North Dakota. It has similarly proposed \$24 million in annual costs on a coal-fired power plant in Nebraska. Unfortunately, the agency is only getting started. In the near term, EPA is poised to act in Wyoming, Minnesota, Arizona, Utah, and Arkansas. Its real goal is to impose another costly regulation on electric utilities and force them to shut down their coal-fired generating units. Ultimately, all states could be subject to EPA's Regional Haze power grab.

Regional Haze Regulation: The Basics

In the 1977 amendments to the Clean Air Act, Congress created a regulatory program to improve visibility, known as Regional Haze.² According to EPA, "Haze is caused when sunlight encounters tiny pollution particles in the air. Some light is absorbed by particles. Other light is scattered away before it reaches an observer. More pollutants mean more absorption and scattering of light, which reduce the clarity and color of what we see. Some types of particles, such as sulfates, scatter more light, particularly during humid conditions."³ The "national goal" of EPA's Regional Haze program, as defined by the statute, is the "remedying of any existing, impairment of visibility" at 156 federal National Parks and Wilderness Areas known as Class I Areas.⁴ EPA maintains a map of Class I Areas.



A defining characteristic of the Regional Haze law is that states, not EPA, are the lead decision makers. In floor debate in 1977, Congress unequivocally said that states would have the authority to decide how much value to assign to an aesthetic benefit,⁸ and the resulting language of the Clean Air Act reflects this fact.⁷ According to the D.C. Circuit, this “confirms that Congress intended the states to decide which sources impair visibility and what BART [Best Available Retrofit Technology] controls should apply to those sources.”⁹ Such discretion to states is notable given the Clean Air Act’s approach to other air quality programs. For public health air quality regulations created by the statute, like the National Ambient Air Quality Standards program, EPA sets nationwide emissions standards, regardless of cost, and then states must submit plans to meet these standards. For Regional Haze, by contrast, the Clean Air Act calls for states to determine both the emissions standards

and the appropriate controls. EPA’s primary role in the Regional Haze program is to provide procedural and technical support.⁹

The mandate that states have primacy over visibility improvement policy is also established in the *Code of Federal Regulations* and even in EPA’s own implementation guidance for Regional Haze.¹⁰ Moreover, the judiciary has affirmed state precedence: Federal courts have twice remanded EPA’s Regional Haze rules for inadequately preserving the authority of state governments.¹¹

In spite of the aforementioned legal and regulatory history, which demonstrates that Congress wanted states to call the shots on Regional Haze, EPA is now implementing a program that tramples over the states’ authority. EPA’s approach to Regional Haze appears to be less about cleaning up haze and more

about furthering EPA's agenda to shut down coal-fired power plants.

Using Sue and Settle to Shut Down Industry

The heart of the matter is that the states, after years of deliberation, selected specific emissions controls to comply with the Regional Haze regulation. In each of these states, EPA prefers different, more stringent, and more costly controls. And EPA is determined to force the states to implement these more costly controls over any and all objections. The problem is that the law provides primacy for the states—not EPA—to address regional haze within the states' borders.

Enter Sue and Settle. Beginning in 2009, a group of nonprofit environmental advocacy organizations—Sierra Club, WildEarth Guardians, Environmental Defense Fund, National Parks Conservation Association, Montana Environmental Information Center, Grand Canyon Trust, San Juan Citizens Alliance, Our Children's Earth Foundation, Plains Justice, and Powder River Basin Resource Council—filed lawsuits against EPA alleging that the agency had failed to perform its nondiscretionary duty to act on state submissions for regional haze. Rather than defend these cases, EPA simply chose to settle. In five Consent Decrees negotiated with environmental groups¹²—and, importantly, without notice to the states that would be affected¹³—EPA agreed to commit itself to various deadlines to act on all states' visibility improvement plans.

What EPA did next is Washington politics at its worst. On the eve of the deadlines that EPA had set for itself in the Consent Decrees, the agency found that it could not approve the states' submissions due to alleged procedural problems, such as inadequate cost estimates. The Consent Decree deadlines do not afford states sufficient time to correct the alleged procedural inadequacies. In some cases (New Mexico and North Dakota) EPA refused to even consider important information submitted by the state in order to comply with the deadline. Then, EPA claimed that it had no choice but to impose its preferred controls in order to comply with the Consent Decrees.¹⁴ Of

course, none of this would have been necessary (or even allowed) if EPA had not voluntarily bound itself to a court order dictating the terms of the Regional Haze approval process. But by second-guessing the *process* that states use to make their determinations, EPA argues that it is not running afoul of the Clean Air Act in injecting itself to decide the *substance* of what is inherently a state decision. In EPA's view, it is not directly questioning a state's choice of emissions controls to comply with the Regional Haze regulation, but it is merely imposing federal controls because the court-imposed deadline leaves it no other option. But the end result is unquestionably the same.

A common reason that EPA cites as a procedural inadequacy in state submissions is incorrect estimation of costs. But EPA's own basis for this assertion is itself suspect. For example, in the course of reviewing Regional Haze implementation plans submitted by New Mexico,¹⁵ Oklahoma,¹⁶ and North Dakota,¹⁷ EPA hired an independent contractor, to vet the states' cost-effectiveness analysis. In Nebraska, EPA audited the states' analysis using this same independent contractors' previous Regional Haze work in Oklahoma.¹⁸ In fact, this independent contractor is a paid consultant who routinely serves as a witness for the very same environmental groups who sued to obtain the Regional Haze Consent Decrees.¹⁹ Unsurprisingly, the cost-estimates of controls at coal-fired power plants by EPA's paid consultant were hundreds of millions of dollars lower than those performed by state officials in New Mexico, Oklahoma, North Dakota, and (by extension) Nebraska, after years of deliberation. EPA then predicated its disapproval of these states' Regional Haze strategies based largely on the work of this hired contractor.

How EPA Engineered Control Over a Purely State Program

This point bears repeating: By second-guessing these states' cost-effectiveness calculations, EPA in the ordinary course could forestall the approval of a state's Regional Haze implementation plan, but it could not on its own impose its preferred emissions controls. *But by combining this tactic of delaying approval of the state plans with Sue and*

Settle and a court-imposed deadline to act, EPA has manufactured a loophole to provide itself with the ability to reach into the state haze decision-making process and supplant the state as decision maker. EPA has, effectively, engineered a way to get around the protections of state primacy built into the Regional Haze statute by Congress.

Since August 2011, EPA has used this method to impose almost \$375 million in annual costs on ratepayers in New Mexico, Oklahoma, and North Dakota—over the staunch objection of their governors—by requiring installation of more costly controls than the BART controls each state chose. Agencies in these states had spent years preparing Regional Haze strategies to improve visibility, in accordance with the procedures set out by the Clean Air Act. Yet EPA discarded these plans and imposed federal controls in their stead.

All Cost, No Benefit

Beyond the fundamental interference with state primacy on regional haze issues, there are two specific problems with EPA's plan: (1) It is several times more expensive than the states' preferred haze controls, and (2) it offers little to no discernible visibility benefits over the states' preferred haze controls. For utilities and their customers, EPA's Regional Haze program is all cost, no benefit.

In North Dakota, the state proposed the installation of Selective Non-Catalytic Reduction (SNCR) at a total cost of \$50 million for all of the state's plants. EPA rejected the state's proposal and forced a FIP upon the state, instead requiring Selective Catalytic Reduction (SCR) at a cost of more than \$500 million. After public pressure and an unfavorable court ruling, EPA largely backtracked.²⁰ However, the agency still is imposing the installation of unnecessary retrofits²¹ that result in a cost differential of almost \$12 million per year for the state.

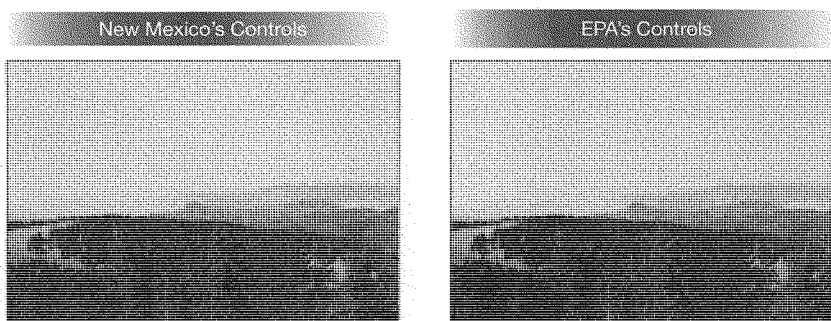
In Arizona, the Navajo Generating Station installed low nitrogen oxides (NOx) burners at a cost of \$45 million. An SCR system for the plant would cost more than \$700 million. In Wyoming, EPA has proposed to impose \$96 million per year in unjustified

costs. Oklahoma had a simple solution to switch from coal to natural gas (making even greater emissions reductions), but instead EPA required retrofitting existing plants with the most stringent sulfur dioxide controls available at a cost of \$1.8 billion.

The National Renewable Energy Laboratory (NREL), at the request of the U.S. Department of the Interior, performed a study on the impact of EPA's proposed haze requirements on the Navajo Generating Station in Arizona.²² NREL found that EPA's proposed haze controls would cause "no discernible change" on the plant's potential health effects or impact on groundwater.²³ Regarding visibility impacts of NOx emissions, NREL wrote: "Whether the incremental contribution is significant or even perceptible is a matter of debate among experts in the field of visibility science."²⁴

Visibility is a measure of how well an observer can view a scene, including how far one can see and the ability to see textures and colors. Visibility is reduced and haze is increased by the absorption and scattering of light by gases and aerosols (particles) in the atmosphere. These gases include sulfates and nitrates from the combustion of coal by electric generating plants. EPA uses a metric known as a "deciview" to measure the amount of haze as it relates to the amount of light that is scattered and absorbed. A deciview value of 0 represents the clearest possible visibility, i.e., the view is unaffected by haze. As the deciview number increases, visibility becomes progressively poorer. In theory, an increase of 1 deciview is supposed to reduce visibility enough to be discernible to the naked eye. In reality, however, a change of up to 2 deciviews is impossible for most people to see.²⁵ Because all but one²⁶ of the visibility improvements mandated by EPA's proposed regional haze rule will only result in deciview reductions of less than 2, these visibility improvements will not be discernible. In other words, utilities may have to spend billions of dollars for visibility improvements that no one will be able to see or even notice.

Consider, for example, the actual difference EPA's preferred controls would make in New Mexico:



White Mountain Wilderness Area, New Mexico

Visibility comparisons for six states are included in state one-pagers at the end of this report. A full description of the methodology used to generate these photos is available in Appendix B.

Unfortunately, EPA is only getting started. In the immediate future, the agency is poised to impose similar constraints on Wyoming, Minnesota, Arizona, Utah, and Arkansas—all in the name of imperceptible “improvements” in visibility. Ultimately, as explained later, no state is immune from having its rightful Regional Haze authority trumped by EPA at profound costs for virtually nonexistent benefits.

EPA's True Motive: Shutting Down Coal

The Obama administration has made no secret that it seeks to use regulations to put the coal industry out of business. The strategy is simple: Impose the most burdensome controls on all coal-fired power plants regardless of whether or not they are necessary. While campaigning for the presidency in January 2008, then-candidate Barack Obama told the editorial board of the *San Francisco Chronicle* that “If someone wants to build a new coal-fired power plant they can, but it will bankrupt them because they will be charged a huge sum for all the greenhouse gas that’s being emitted.”²⁷ More recently, in a speech to Howard University students in October 2011, EPA Administrator Lisa Jackson said: “In their [the coal industry] entire history—50,

60, 70 years, or even 30 ... they never found the time or the reason to clean up their act. They’re literally on life support. And the people keeping them on life support are all of us.”²⁸

EPA is inching closer to its goal. Recent reports by the National Mining Association and the Institute for Energy Research indicate that between 25 and 33 gigawatts (GW) of coal-fired electricity generation²⁹ are set to be retired due to the suite of anti-coal regulations issued by EPA since President Obama took office, including new rules targeting hazardous air pollutant emissions and the interstate movement of air pollutants. Fifty-seven power plants have gone on the chopping block, meaning the jobs of 29,000 workers have already been placed in jeopardy.

For EPA, the Regional Haze rule is valuable yet relatively quiet ammunition in its war against coal. It unquestionably adds significant new costs to coal-fired power plant operators, costs that will almost certainly be passed on to electricity consumers. But what makes EPA's Regional Haze program so striking is that it accomplishes nothing other than imposing new costs for power plants. It is a visibility regulation that does nothing to improve the view. It is a regulatory means to an end—namely, imposing the most expensive possible controls on every coal-fired power plant regardless of whether it makes sense to do so.

Regional Haze Is Not Just a Western Problem

There is a common misperception that Regional Haze is a western problem. This is because EPA has proposed to allow states to meet the preponderance of their Regional Haze commitments by participating in the Cross State Air Pollution Rule (CSAPR),³⁰ which is confined largely to eastern states. Thus, EPA proposed to approve 20 Regional Haze plans in January and February 2012.³¹

CSAPR states are not, however, in the clear. In fact, they may be worse off than non-CSAPR states. They face a “double dip” of redundant 1999 and 1980 Regional Haze regulations being implemented by EPA as “phase one” and “phase two” of a larger Regional Haze plan. This power grab is a result of the phased approach EPA has used in implementing the Regional Haze program. EPA first issued Regional Haze regulations in 1980.³² At that time, computing was nascent and complex atmospheric modeling was nonexistent. As a result, EPA largely deferred requiring states to act because attributing visibility impairment to a specific source was impossible. Nineteen years later, in 1999, atmospheric modeling had advanced to the point whereby EPA could support a regulatory regime to improve visibility, and the agency issued a second set of Regional Haze regulations.³³ For whatever reason, EPA never repealed the 1980 regulation (known as Reasonably Attributable Visibility Impairment or RAVI), despite the fact that its most significant requirements were virtually identical to the 1999 Regional Haze program. Therefore, both regulations remain on the books, even though they are essentially duplicates.³⁴

Now, EPA is claiming authority to impose both of these copycat Regional Haze regulations, one on the heels of the other. On January 25, 2012, EPA proposed to approve Minnesota’s preferred Regional Haze controls for the 2025-megawatt Sherburne County Generating Plant (Sherco Plant) operated by Xcel Energy. EPA predicated its proposed approval based on the state’s participation in the CSAPR.³⁵

However, in the same notice, EPA warned that it would soon be issuing further Regional Haze requirements for the Sherco Plant pursuant to

the 1980 RAVI regulations.³⁶ In discussions with the Minnesota Pollution Control Agency, EPA has indicated that it will press for \$250 million in “double dip” controls, specifically SCR technology.³⁷ As is seen in the Minnesota Case Study later in this paper, EPA’s preferred RAVI controls would achieve an imperceptible benefit in visibility improvement. The Minnesota example makes clear that there is no refuge from EPA’s visibility regulations.

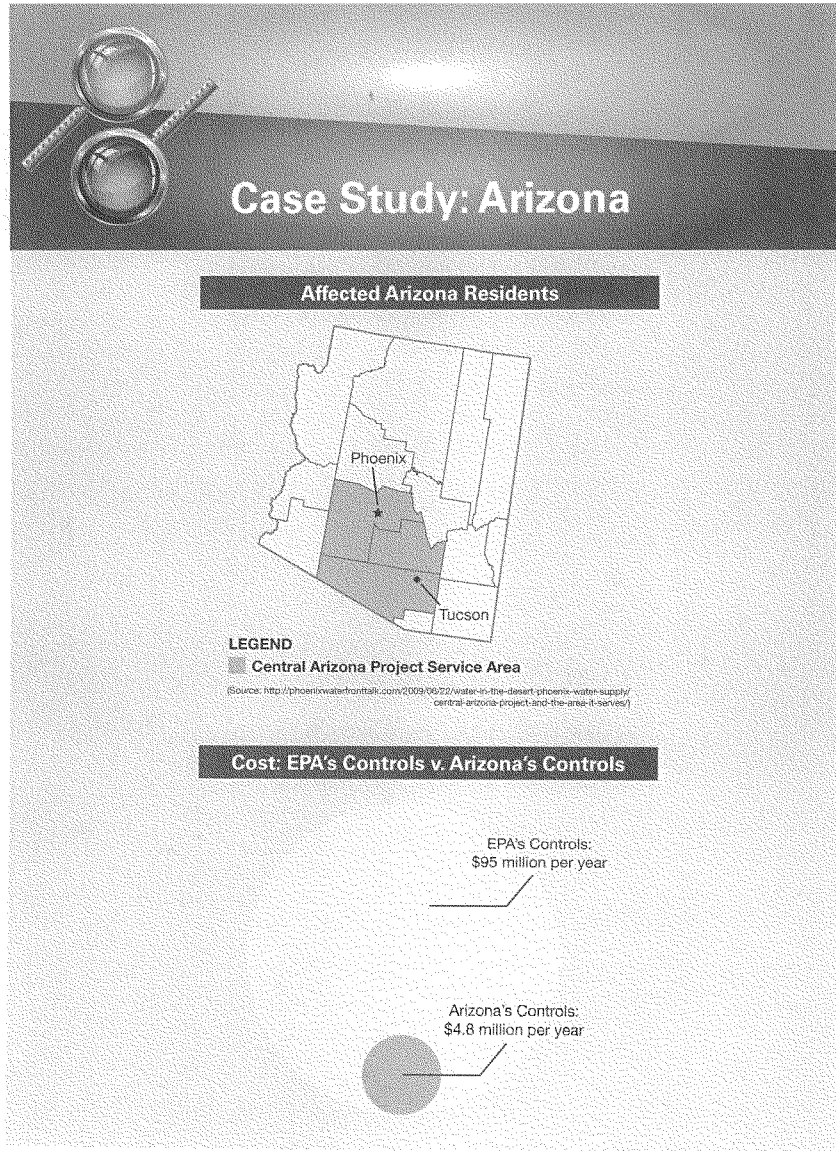
In the long term, EPA’s abuse of its Regional Haze authority could present a persistent problem for all states. Under its rules, states must revise their Regional Haze implementation plans every 10 years, until the nation’s ambient air is returned to natural conditions (which is to say, forever). If EPA’s regional haze power grab is allowed to stand, then the agency would have assumed an enormous new source of authority, with which it could effectively impose whatever controls it wants once every decade.

It is thus imperative for states to act now to check EPA on Regional Haze, thereby preserving the structure established by Congress and ensuring the balance of environmental federalism.

Endnotes

1. <http://www.epa.gov/aboutepa/whatwedo.html>.
2. 42 U.S.C. § 7491.
3. EPA, Visibility, Basic Information, www.epa.gov/visibility/what.html.
4. 42 U.S.C. § 7491(a)(1).
5. http://www.epa.gov/ttr/oarpg/t1/fr_notices/classimp.gif.
6. The House and Senate versions of the 1977 Amendments to the Clean Air Act differed on the balance of federalism for the Regional Haze provision. In conference, members of Congress came to an agreement whereby states would have a distinctly high degree of primacy vis a vis EPA. Consider this floor exchange between Sens. James A. McClure (ID) and Edmund Muskie (ME):
 Mr. McClure: "Under the conference agreement, does the State retain the sole authority for identification of sources for the purpose of visibility issues under this section?"
 Mr. Muskie: "Yes, the State, not [EPA] Administrator, identifies a source that may impair visibility and thereby falls within the requirement of [Regional Haze]."
 Mr. McClure: "And does this also hold true for determination of 'Best Available Retrofit Technology' [a primary control required by the Regional Haze program]?"
 Mr. Muskie: "Yes. Here again it is the State which determines what constitutes 'Best Available Retrofit Technology'..." See *Congressional Record*-1977-0804-26854.
7. See 42 U.S.C. § 7491(b)(2)(A), which stipulates that states determine both which sources are subject to Best Available Retrofit Technology and what constitutes BART; see also *id.* at § 7491(a)(1)(i)(2), which states that BART determinations can be made only after consideration of costs.
8. *American Corn Growers Ass'n v. EPA*, 291 F.3d 1, 8 (D.C. Cir. 2002).
9. See 42 U.S.C. § 7491 (a)(3), which calls for EPA to conduct a "report" on Regional Haze attribution and modeling, and § 7491(b)(1), which establishes that EPA must use the aforementioned report to inform "guidelines" on "appropriate techniques and methods" for states to use when making determinations for "Best Available Retrofit Technology."
10. See 40 C.F.R. § 51.308(e), which establishes the process by which states—and not EPA—make both attribution and determination decisions for Best Available Retrofit Technology standards required by Regional Haze. In the preamble to these BART guidelines, EPA noted, "[T]he [Clean Air] Act and legislative history indicate that Congress evinced a special concern with insuring that States would be the decision-makers." 70 Fed. Reg. 39137.
11. *Center for Energy and Economic Development v. EPA*, 398 F.3d 653 (D.C. Cir. 2005); *American Corn Growers Ass'n v. EPA*, 291 F.3d at 8.
12. The five Consent Decrees:
National Parks Conservation Ass'n et al. v. Jackson, Civil Action No. 1: 11-cv-01548 (D.D.C. Dec. 2, 2011)
Sierra Club v. Jackson, No. 1:10-cv-02112-JEB (D.D.C. Aug. 18, 2011)
WildEarth Guardians v. Jackson, No. 1:11-cv-00743-CMA-MEH (D. Col. June 16, 2011)
WildEarth Guardians v. Jackson, No. 4:09-CV-02453 (N.D. Cal. Feb. 23, 2010)
WildEarth Guardians v. Jackson, No. 1:10-cv-01218-REB-BNB (D. Col. Oct. 28, 2010)
13. See, e.g., Comments submitted by Sue Kidd, Director, Environmental Policy and Programs, Arizona Public Service, Document ID EPA-HQ-OGC-2011-0929-0013, available at www.regulations.gov. ("Finally, APS is concerned that Arizona was not properly consulted by EPA prior to entering into the proposed consent decree with the environmental plaintiffs. Given the lead role and considerable discretion given to states by Congress under the regional haze provisions of the CAA, it is axiomatic that EPA should have discussed with ADEQ the terms of the proposed consent decree before signing it.")
14. In New Mexico, EPA used a putatively nondiscretionary consent decree deadline to actually ignore the state's Regional Haze submission. "We did receive a New Mexico RH SIP submittal on July 5, 2011, but it came several years after the statutory deadline, and after the close of the comment period on today's action. In addition, because of the missed deadline for the visibility transport, we are under a court-supervised consent decree deadline with WildEarth Guardians of August 5, 2011, to have either approved the New Mexico SIP or to have implemented a FIP to address the 110(a)(2)(D)(i) provision. It would not have been possible to review the July 5, 2011 SIP submission, propose a rulemaking, and promulgate a final action by the dates required by the consent decree." 76 Fed. Reg. 52390.
 Likewise, in North Dakota, where EPA tried to ignore a major component of the state's Regional Haze submission (namely, North Dakota Department of Environmental Quality's Best Available Control Technology determination for the Milton R. Young power plant). EPA said, "Given our September 1, 2011 deadline to sign this notice of proposed rulemaking under the consent decree discussed in section III.C, we lack sufficient time to act on or consider this aspect of Amendment No. 1. Under CAA section 110(k)(2), EPA is not required to act on a SIP submittal until 12 months after it is determined to be or deemed complete. We have considered some of the documents related to the State's BACT determination for Milton R. Young Station and have included those documents in the docket for this proposed action." 76 Fed. Reg. 58579.
 In promulgating a federal implementation plan for Regional Haze on Oklahoma, EPA stated, "We also are required by the terms of a consent decree with WildEarth Guardians, lodged with the U.S. District Court for the Northern District of California, to ensure that Oklahoma's CAA requirements for 110(a)(2)(D)(i) (ii) are finalized by December 13, 2011. Because we have found the state's SIP submissions do not adequately satisfy either requirement in full and because we have previously found that Oklahoma failed to timely submit these SIP submissions, we have not only the authority but a duty to promulgate a FIP that meets those requirements." 76 Fed. Reg. 81732.
15. See "Revised BART Cost-Effectiveness Analysis for Selective Catalytic Reduction at the Public Service Company of New Mexico San Juan Generating Station." Final Report, prepared by Dr. Phyllis Fox, Ph.D. (November 2010).
16. 76 Fed. Reg. 16183, at n.24.
17. 76 Fed. Reg. 58599, at n.22.
18. See Appendix B. "EPA's evaluation of cost of Flue Gas Desulfurization (FGD) controls Nebraska Public Power District (NPPD) Gerald Gentlemen Station (GGS), Units 1,2," to EPA Region 7 Technical Support Document, available at www.regulations.gov. Document ID No. EPA-R07-OAR-2012-0158-002.
19. See "Dr. Fox Resume," 25 February 2011, available at www.regulations.gov. Document ID No. EPA-R06-OAR-2010-0190-0070.
20. For a Prevention of Significant Deterioration (PSD) Best Available Control Technology (BACT), which is by statute more

- onerous than the BART for Regional Haze) determination at the Milton R. Young station, North Dakota said that SCR was infeasible because the Milton R. Young station is a cyclone boiler that burns lignite coal. EPA argued that SCR was feasible. On December 21, 2012, the U.S. District Court for the District of Columbia ruled in favor of the state. The Milton R. Young plant, in addition to being subject to BACT (for PSD), was also subject to BART (for Regional Haze). Because the courts ruled that SCR was infeasible for BACT, it was also infeasible for BART, at both Milton R. Young and another coal-fired power plant with a cyclone boiler, Leland Olds.
21. Namely, an unnecessary SNCR system at the Coal Creek Units and an unnecessary Low Nitrogen Boiler unit at the Antelope Valley Station.
 22. David J. Hurlbut et al., "Navajo Generating Station and Air Visibility Regulations: Alternatives and Impact," National Renewable Energy Laboratory, available at <http://www.nrel.gov/docs/fy12osti/53024.pdf>.
 23. *Id.* at iv.
 24. *Id.*
 25. Henry, R.C., "Just Noticeable Differences in Atmospheric Haze," *Journal of the Air & Waste Management Association*, 52:1238-1243, October 2002.
 26. Oklahoma was a 2.89 deciview delta.
 27. <http://www.politifact.com/ohio/statements/2011/mar/14/ohio-coal-association/ohio-coal-industry-says-obama-promised-bankrupt-co>.
 28. <http://www.wmetronews.com/news.cfm?func=displayfullstory&storyid=46811>.
 29. Institute for Energy Research, "Impact of EPA's Regulatory Assault on Power Plants: New Regulations to Take 33 GW of Electricity Generation Offline and the Plant Closing Announcements Keep Coming . . .," Feb. 7, 2012, available at <http://www.instituteenergyresearch.org/2012/02/07/impact-of-epas-regulatory-assault-on-power-plants-february-7-update>.
 30. 76 Fed. Reg. 82219.
 31. New Jersey (proposed approval 3 January 2012); Minnesota, Virginia, Ohio (proposed approval 25 January 2012); Illinois, Delaware (proposed approval 26 January 2012); Alaska (proposed approval 26 February 2012); Georgia (proposed approval 27 February 2012); Rhode Island, New Hampshire, Maryland, North Carolina, Michigan, South Carolina, Vermont, Wisconsin, Alabama, Missouri, Iowa (proposed approval 28 February 2012).
 32. 40 C.F.R. §§ 51.302-51.306.
 33. 64 Fed. Reg. 35714.
 34. Both Regional Haze and RAVI require Best Available Retrofit Technology. The difference between the two programs is that states get to decide which units are subject to Regional Haze BART, whereas Interior Department officials have the authority to determine which units are subject to RAVI BART. Department of Interior federal land managers are the stewards of Class 1 Areas, which is why EPA's 1980 RAVI regulations incorporated their input. As explained above, however, the Regional Haze and RAVI regulations are largely duplicative, and it is not clear why RAVI was not excised from the Code of Federal Regulations with the promulgation of the Regional Haze regulations. Moreover, the Congressional history of the Regional Haze provision makes clear that States—not the federal government—are to make attribution decisions for sources subject to Best Available Retrofit Technology. Complicating matters further is the fact that there has not yet been a Best Available Retrofit Technology determination made pursuant to RAVI, so no State has yet challenged the Interior Department's authority to determine which sources are subject to RAVI requirements. None of this should matter, though, because there is no practical difference between the requirements pursuant to the 2 regulations (RAVI and Regional Haze), so it is nonsensical for federal land managers to subject to RAVI an entity that is already subject to Regional Haze. Unfortunately, this is exactly what the Interior Department has done. In 2009, it decided to subject the Sherco Units 1 and 2 to RAVI BART, despite the fact that Minnesota, at the time, was crafting a Regional Haze BART determination for the power plant. Therefore, the only thing that stands in the way of EPA "double dipping" on Regional Haze is the Department of the Interior, which is to say that the only thing preventing the Obama administration from imposing the same regulation twice on coal-fired power plants is the Obama administration.
 35. 77 Fed. Reg. 3681.
 36. 77 Fed. Reg. 3689. ("Therefore, this proposed rule only addresses satisfaction of regional haze requirements and does not address whether Minnesota's plan addresses requirements that apply as a result of the certification of Sherco as a RAVI source. EPA will act on RAVI BART in a separate notice.")
 37. See Xcel Energy, Resource Plan Update, Docket No. E002/RP-10-825 before the Minnesota Public Utilities Commission, at 45, 46 (Dec. 1, 2011) ("In its June 2011 preliminary review of the MPSC's BART assessments, EPA Region 5 indicated that it believes BART for (Sherco) Units 1 and 2 should include 'Selective Catalytic Reduction. . . Plant specific estimates for Sherco Units 1 and 2 demonstrate that SCRs would cost customers upwards of \$250 million.'")



Is this worth \$90.2 million per year?

Arizona's Controls	EPA's Controls

Grand Canyon National Park, Arizona

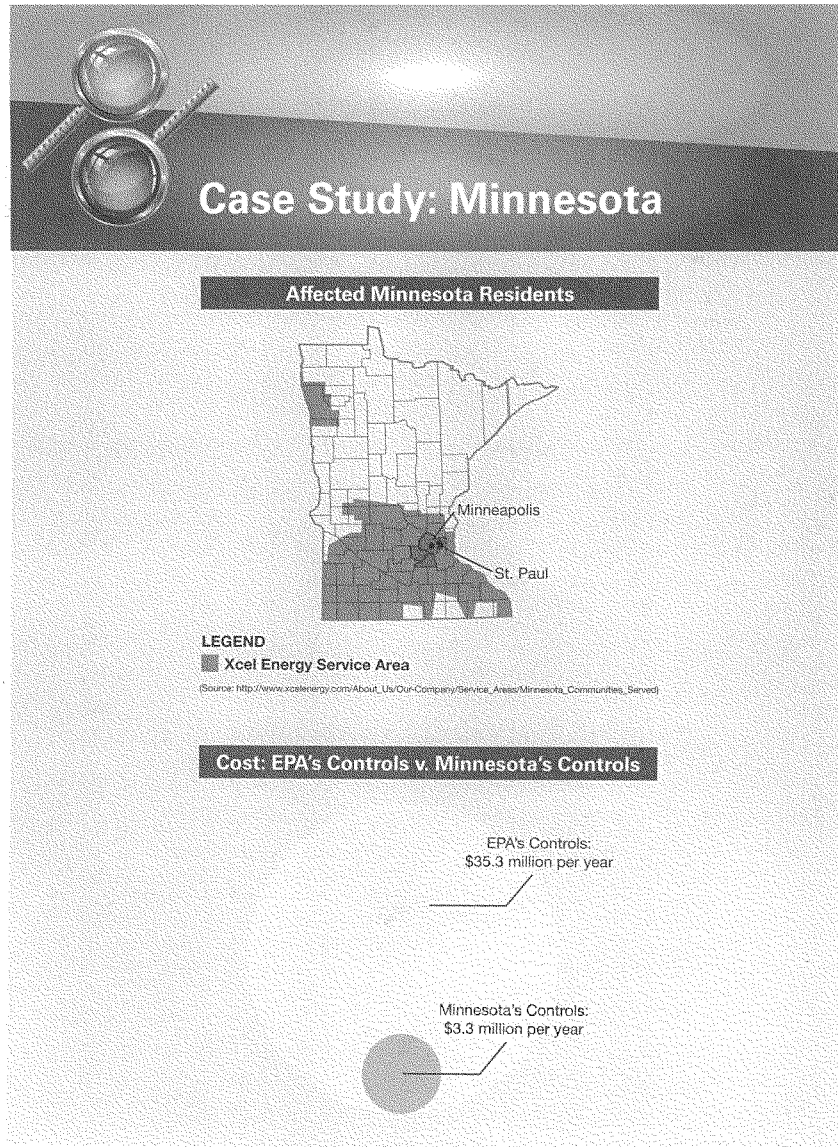
In most states, EPA's Regional Haze regulation threatens to raise electricity bills; however, in Arizona, it threatens to increase the cost of water.

The Navajo Generating Station on the Navajo Nation territory powers the Central Arizona Project, a massive water delivery project that provides almost 20% of the state's water needs.

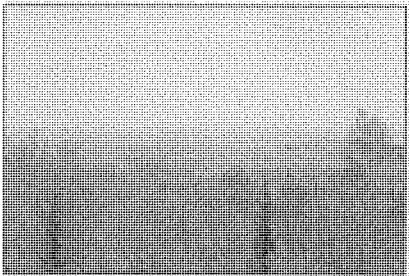

In August 2009, EPA solicited public comments on possible Regional Haze controls for nitrogen oxides that the plant operator, Salt River Project, estimated would cost \$700 million.¹ EPA limited the scope of its solicitation to comments on the price of electricity, despite the fact that the impact would be felt by water consumers. EPA's proscribed analysis engendered concerned

comments from Navajo,² Arizona,³ and even federal officials⁴ (the Bureau of Reclamation owns a 25% stake in the power plant).

According to peer-reviewed research, there is a maximum probability of 35% that the slight improvement in visibility caused by EPA's preferred controls would be detectable to the human eye (see the images above).⁵ To achieve this "benefit," a federal study estimates that EPA's controls would increase the price of water 15% in central and southern Arizona.⁶ The agency's decision is expected in spring 2012.



Is this worth \$32 million per year?

Minnesota's Controls	EPA's Controls
	

Boundary Waters Canoe Area, Minnesota

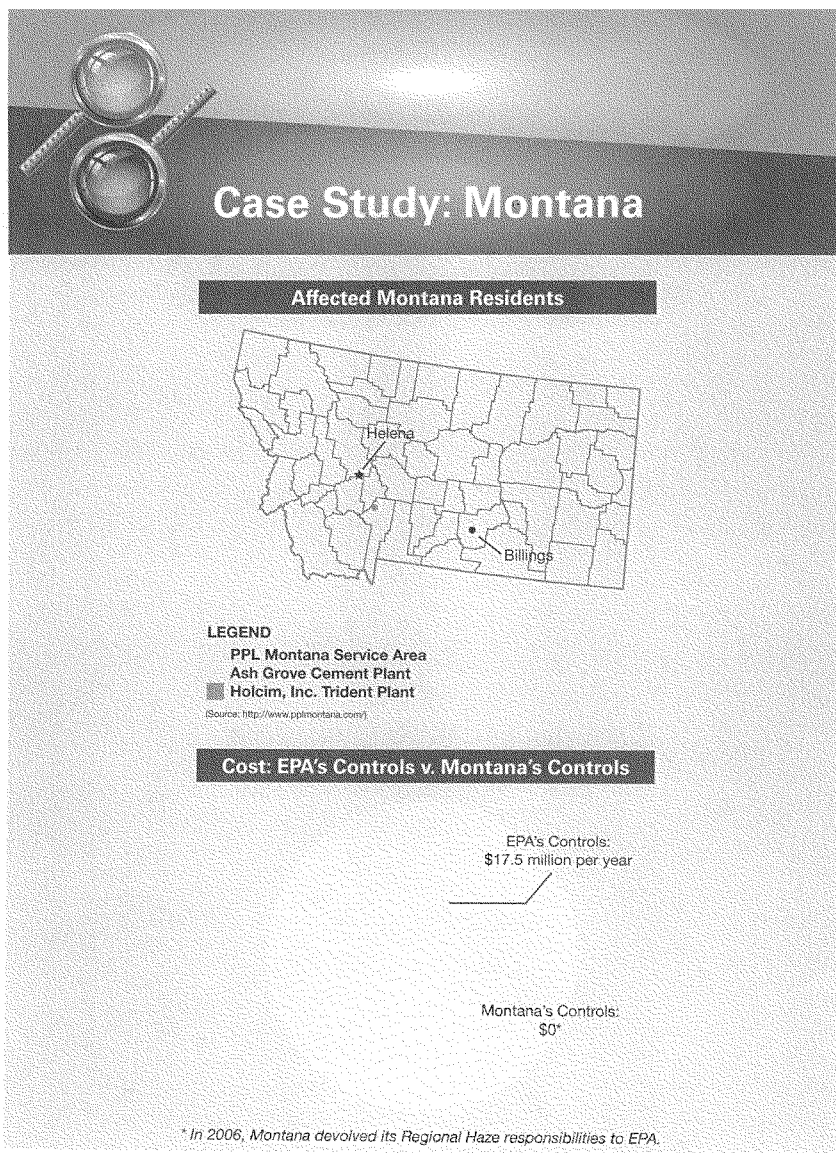
Minnesota is subject to back-to-back Regional haze regulations. EPA is claiming authority to regulate Regional Haze twice in succession at the 2,255 megawatt Sherburne County Generating Plant (Sherco) operated by Xcel Energy.

This regulatory "double-dip" is achieved by an illogical reading of the agency's Regional Haze rules. On the one hand, EPA claims that the Sherco Plant warrants regulation because it is "reasonably anticipated" to cause visibility impairment at the Boundary Waters Canoe Area (BWCA); on the other, EPA claims that visibility impairment at BWCA is "reasonably attributable" to the Sherco Plant,¹ which merits further regulation. Of course, these statements are identical. If it is "reasonably anticipated" that

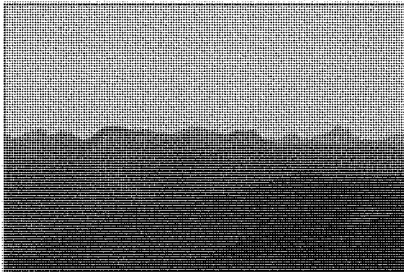
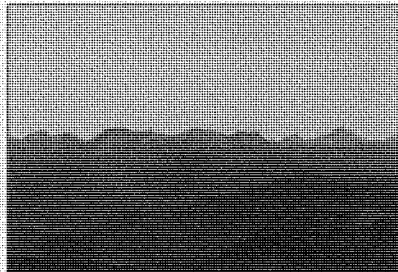
Sherco impairs visibility at BWCA, then visibility impairment at BWCA is necessarily "reasonably attributable" to the Sherco Plant.

On the basis of this nonexistent difference, EPA is seizing the authority to regulate twice. In comments to Minnesota, EPA has indicated that an additional \$250 million of controls at the Sherco Plant would be "cost-effective."²

The photos above demonstrate the negligible visibility "improvement" that would be achieved by EPA's Regional Haze "double-dip."



Is this worth \$175 million per year?

Montana's Baseline	EPA's Controls
	

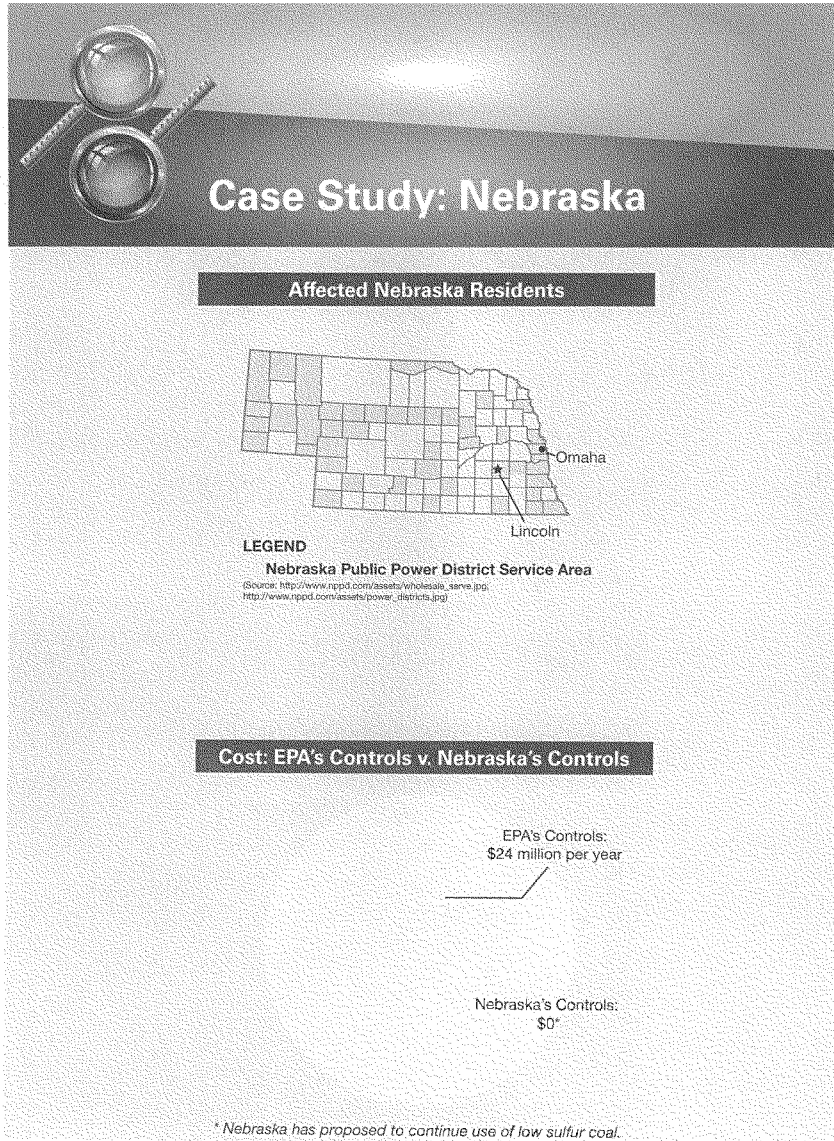
Cabinet Mountains Wilderness Area, Montana

Montana is the only state to have ceded its Regional Haze authority to EPA, a unique characteristic for which the Treasure State is now paying a steep price.

In 2008, the Montana Department of Environmental Quality withdrew its efforts to implement the Regional Haze rule due to the need "to prioritize and redirect scarce resources from secondary welfare programs, such as visibility, to primary public health protection programs."¹ As a result, EPA assumed authority over the state's Regional Haze program.

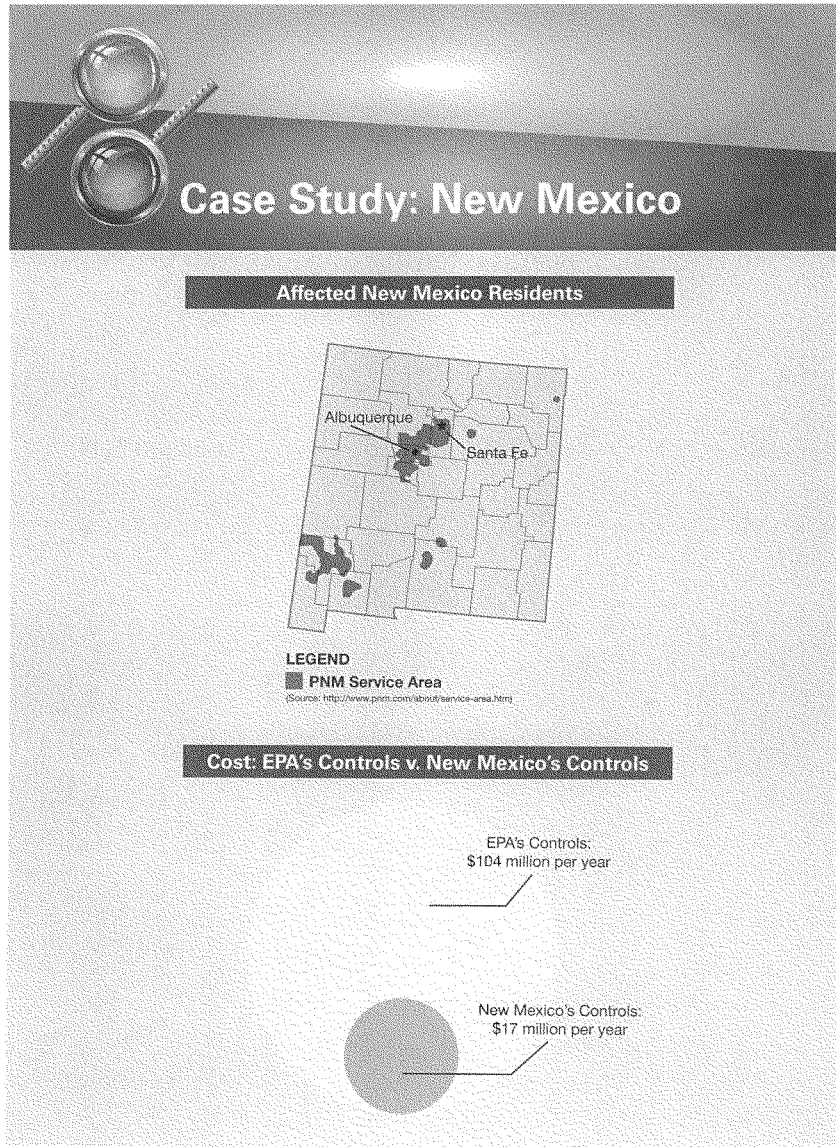
On March 20, 2012, EPA proposed a federal Regional Haze plan for Montana. If finalized, EPA's plan would impose more than \$17 million in annual compliance costs on two cement plants and a coal-fired power plant² to achieve a visibility "improvement" that is invisible to the naked eye (see photo comparison above).

Notably, EPA's proposed Regional Haze controls are almost 250% more expensive than what the agency's standing rules presume to be "cost-effective" for Regional Haze compliance.³

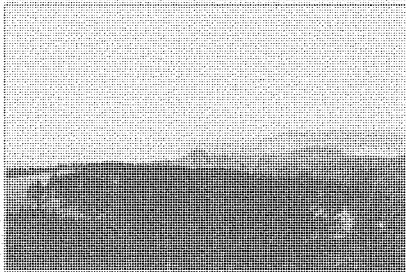
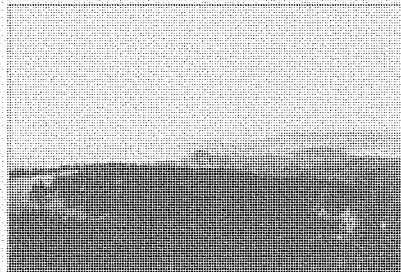


EPA's proposed plan would cost Nebraska almost \$24 million per year.

Nebraska's Controls	EPA's Controls
<p><i>Image Unavailable</i></p>	<p><i>Image Unavailable</i></p>
<p>In Nebraska, EPA is using Regional Haze, an aesthetic regulation, to force the state's participation in a health-based regulation, as if an imperceptible "improvement" in the view at National Parks is equivalent to saving lives.</p> <p>In July 2011, Nebraska submitted a Regional Haze implementation plan to EPA. Under the terms of a Consent Decree signed with environmental groups, EPA must either approve Nebraska's plan or impose a federal implementation plan by June 15, 2012.¹</p> <p>On March 2, 2012, EPA proposed to disapprove part of the state's plan because of alleged "errors and deviations" in Nebraska's cost-effectiveness analysis performed to determine sulfur dioxide Regional Haze controls for the coal-fired Gerald Gentleman Station.² Notably,</p>	<p>EPA's vetting of Nebraska's cost calculations was predicated on the work of a paid consultant who routinely serves as a witness for the very same environmental groups that sued to obtain the Regional Haze Consent Decrees.³</p> <p>Based on EPA's revised cost-effectiveness estimates, the agency proposed to disapprove Nebraska's Regional Haze controls for the Gerald Gentleman Station. In its stead, EPA proposed to force Nebraska to participate in the Cross-State Air Pollution Rule, a health-based regulation. EPA's proposed plan would cost Nebraska almost \$24 million annually⁴ to achieve "benefits" that are invisible.</p>



Is this worth \$87 million per year?

New Mexico's Controls	EPA's Controls
	

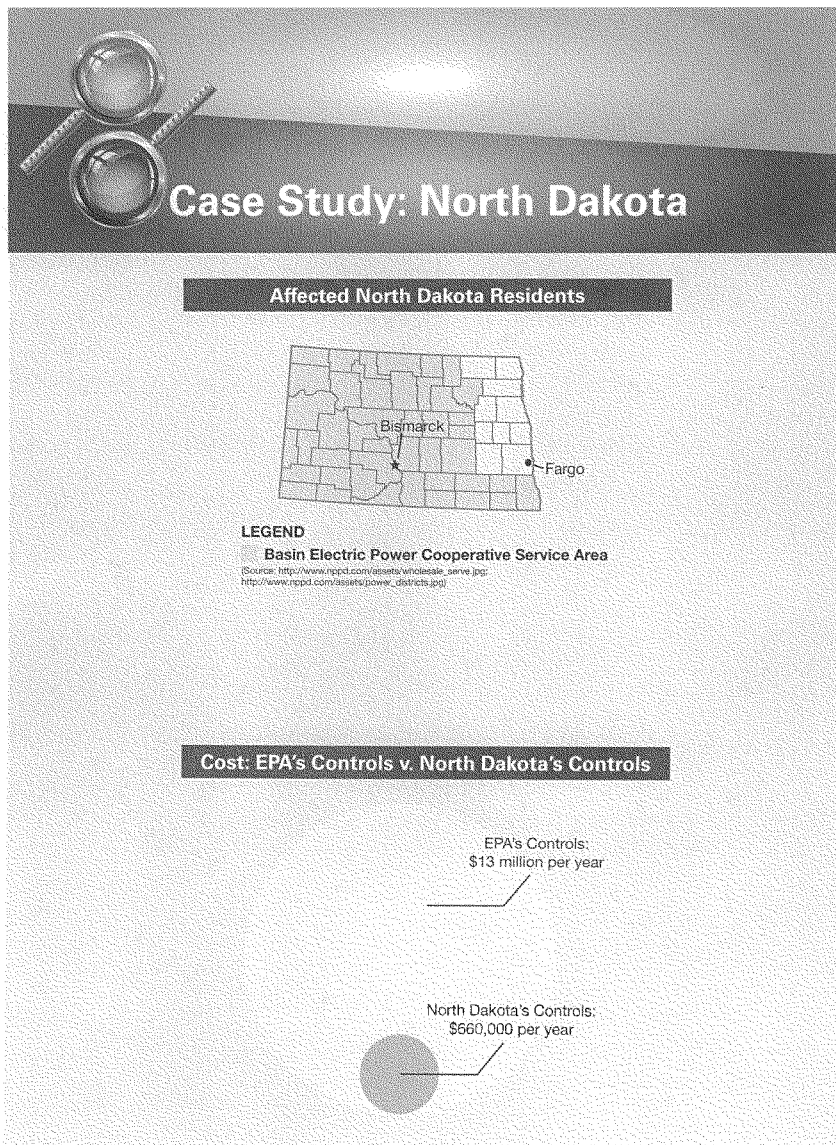
White Mountain Wilderness Area, New Mexico

In July 2011, after four years of careful deliberation, New Mexico submitted a Regional Haze plan to EPA. The state's plan included controls for the 1,800 megawatt San Juan Generating Station that exceeded the Regional Haze emissions targets recommended by EPA's own rules.

The agency, however, refused to even consider New Mexico's plan. Indeed, EPA claimed that it had no choice but to disregard the state's Regional Haze controls because it had to rush to meet a September 2011 deadline negotiated with the environmental group Wild Earth Guardians—without the involvement of New Mexico state officials—and included in a court-approved Consent Decree.¹

On August 22, 2011, EPA imposed a federal plan that requires nearly \$840 million more in capital costs than New Mexico's preferred plan.² In order to achieve a visibility "improvement" that is invisible to the naked eye (see the photo comparison above), According to Xcel Energy, which operates the San Juan Generating Station, EPA's plan would raise utility bills in New Mexico by \$120 annually.³

New Mexico is challenging EPA's plan in the U.S. Court of Appeals for the Tenth Circuit.



EPA's proposed plan would cost North Dakota nearly \$13 million per year.

North Dakota's Controls

***Image
Unavailable***

Although North Dakota is 1 of only 12 states that achieves all of EPA's air quality standards for public health, it would not be able to achieve EPA's Regional Haze goals for visibility improvement even if all industry in the state shut down. This is due primarily to interstate emissions originating in neighboring Canada. Accordingly, North Dakota's Regional Haze plan accounted for international emissions.¹

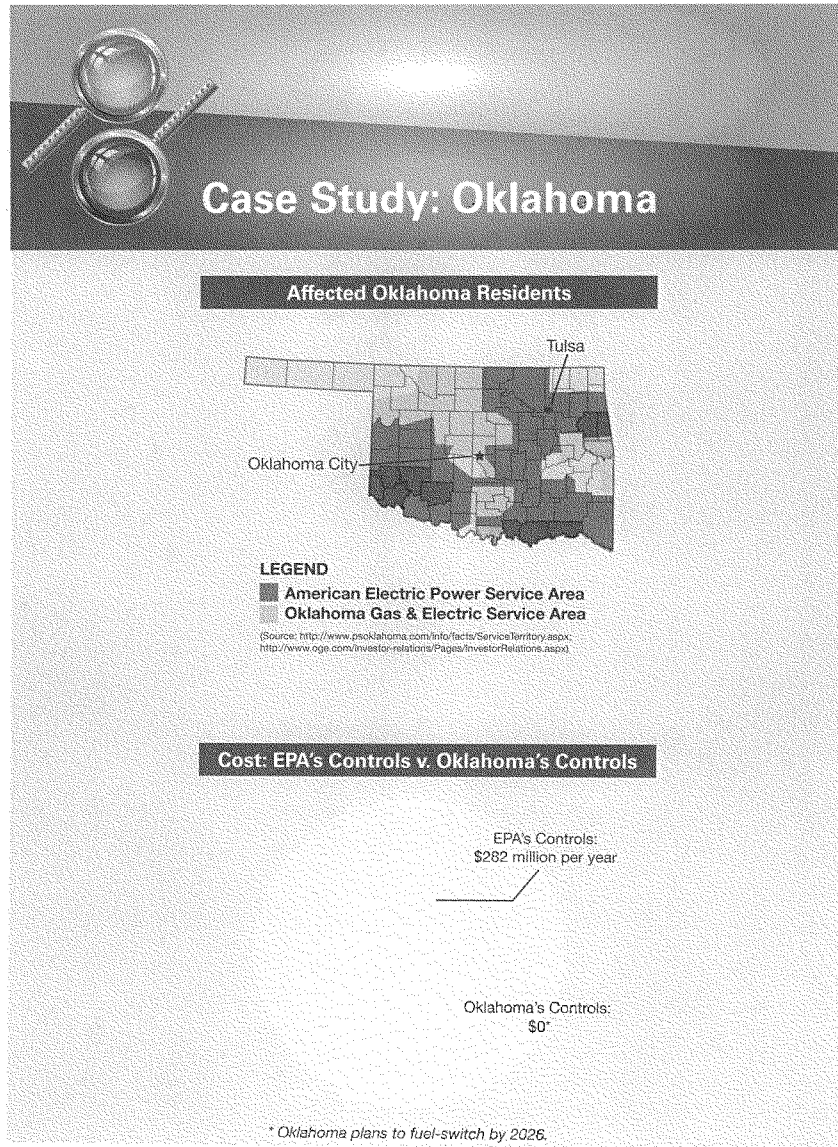
However, EPA determined that such a real world approach was "inappropriate."² On these grounds, EPA partially disapproved the state's Regional Haze plan in early March and then imposed almost \$13 million annually in Regional Haze controls at two power plants in North Dakota over the objections of the state.³

EPA's Controls

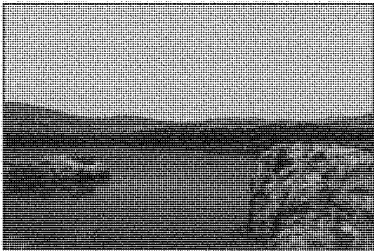
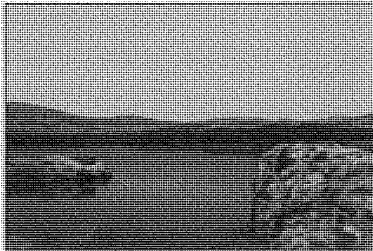
***Image
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Even if one accepts EPA's unrealistic assumption that international emissions should not be considered in Regional Haze planning, the agency's "cost-effective" controls achieve only an imperceptible "improvement" in visibility.

In its proposed Regional Haze federal implementation plan for North Dakota, EPA tried to justify the imposition of more than \$80 million annually in additional emissions controls that the state had determined weren't technologically feasible. EPA only relented after a federal district court in Washington, D.C., ruled in December 2011, that North Dakota was correct and EPA's preferred controls were technologically infeasible.⁴



Is this worth \$282 million per year?

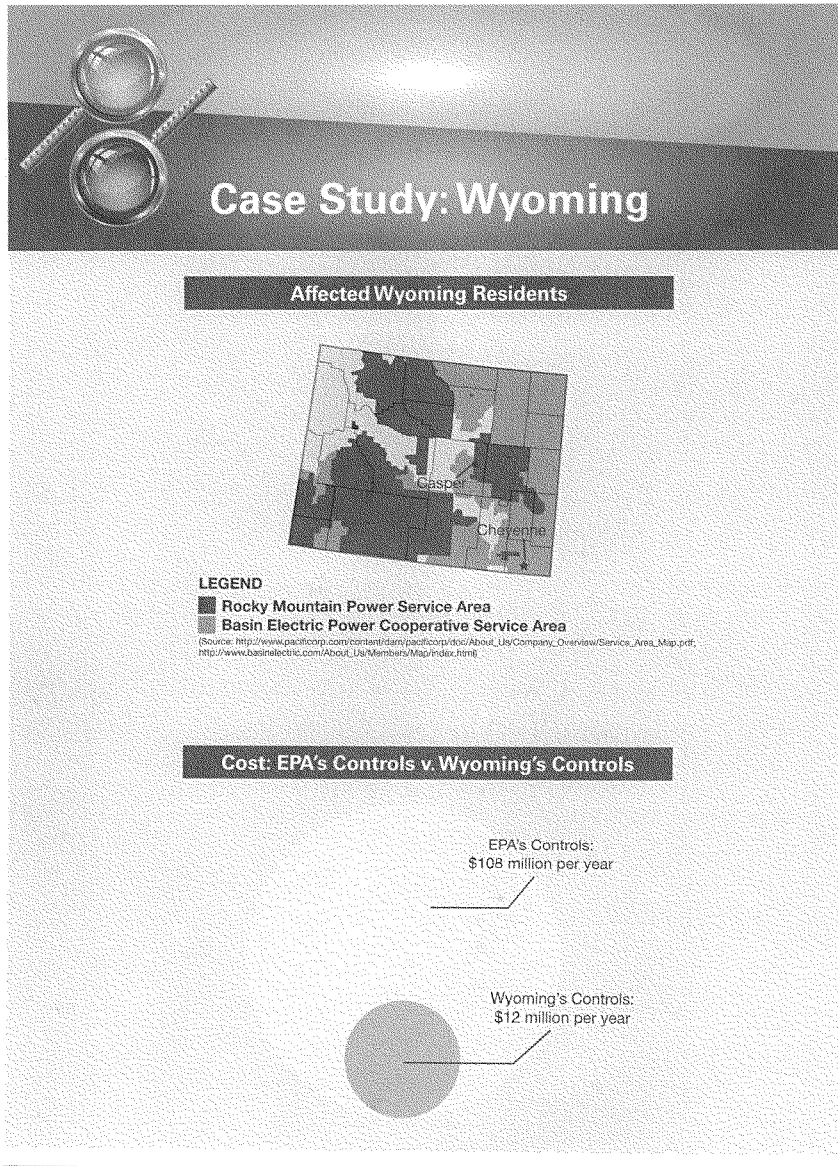
Oklahoma's Controls	EPA's Controls
	

Wichita Mountains Wildlife Refuge, Oklahoma

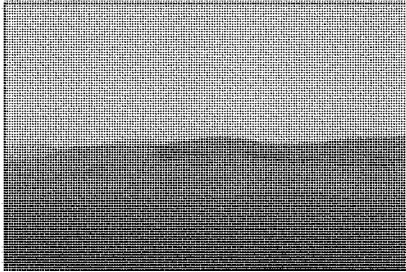
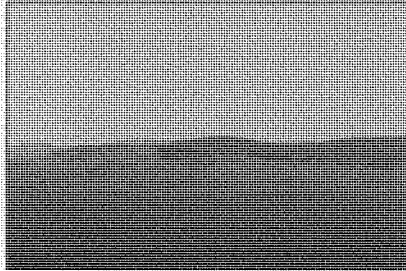
The Clean Air Act explicitly directs states to weigh costs against visibility benefits when they decide how to implement the Regional Haze program. Accordingly, Oklahoma declined to impose the most expensive sulfur dioxide controls on six power plants subject to Regional Haze requirements, because the capital costs—almost \$1.0 billion—were deemed unreasonable in light of the imperceptible benefits (see the photo comparison above). Instead, Oklahoma proposed an alternative plan that would achieve even greater emissions reductions by fuel switching from coal to natural gas.

EPA, however, refused to approve Oklahoma's Regional Haze plan, because the agency objected to the state's cost-effectiveness analysis. On the basis of alternative cost estimates prepared by a paid consultant who routinely serves as a witness for the very same environmental groups that sued to obtain the Regional Haze Consent Decree² and who had not visited the power plants at issue,³ EPA concluded that the most stringent sulfur dioxide controls were cost-effective and imposed them on December 28, 2011.

According to Oklahoma Gas & Electric, EPA's imposed rule would "likely trigger the largest customer rate increase in OGE's history, while the resulting impact on regional haze would be practically imperceptible."⁴



Is this worth \$96 million per year?

Wyoming's Controls	EPA's Controls
	

Snowy Range Scenic Byway, Wyoming

In January 2011, the Wyoming Department of Environmental Quality submitted a Regional Haze implementation plan to EPA. Under the terms of a Consent Decree signed with environmentalist litigants, the agency is required to issue a final determination on Wyoming's Regional Haze plan by October 14, 2012.

On June 4, 2012 EPA proposed to partially disapprove Wyoming's Regional Haze plan and impose a federal implementation plan in its stead.¹ The agency's preferred plan would cost almost \$96 million more than the state's plan,² to achieve an indistinguishable visibility "improvement" (see images above).

In comments to the Wyoming Department of Environmental Quality, EPA faulted the state for having "inflated" the cost-effectiveness estimates for visibility improvement. In particular, EPA critiqued Wyoming's Regional Haze analysis for failing to account for cumulative visibility improvements across multiple federal National Parks and Wilderness Areas, as if multiple imperceptible "improvements" in visibility at different locations (hundreds of miles apart from one another) somehow add up and become perceptible.³ This is an obvious attempt to exaggerate the impact of the agency's preferred, more expensive controls.

Appendix A: Sources for State Case Studies

Arizona

1. Capital costs and annual costs taken from table 12, "NGS Costs of Compliance for NO_x Based on SRP Analysis," 74 FR 44320,44321 (Aug. 28, 2009).
2. See Comment to ANPRM 09 0598 from Dr. Joe Shirley Jr., Navajo Nation, EPA-R09-OAR-2009-0598-0169.
3. See 11-6-2009 EPA letter responding to Arizona Gov. Jan Brewer, EPA-R09-OAR-2009-0598-0203.
4. See 11-25-09 EPA letter to Bureau of Reclamation, in which EPA acknowledges meeting with bureau officials in Phoenix to discuss their reservations with EPA's ANPR, EPA-R09-OAR-2009-0598-0198.
5. The spread between controls preferred by state and Native American officials and those preferred by EPA is .61 deciview. According to Ronald Henry (2005), "Estimating the Probability of the Public Perceiving a Decrease in Atmospheric Haze," *Journal of the Air and Waste Management Association*, Vol. 55 No. 11, p 1760, there is a maximum probability of 35% that a human being could perceive a one deciview change in visibility (see Appendix B for more).
6. Hurlbut et al. (2012) Navajo Generating Station and Air Visibility Regulations: Alternatives and Impacts, Chapter 4, "Central Arizona Project and Navajo Generating Station." This report was the product of an interagency agreement between EPA, the Interior Department, and the Energy Department. After EPA's initial ANPR failed to address the impact of Regional Haze controls at the Navajo Generating Station on water prices, the Bureau of Reclamation balked. As a result of the interagency agreement, the National Renewable Energy

Laboratory performed a study on the possible impacts of various Regional Haze controls. The study is to be considered by EPA before it makes its decision.

Minnesota

1. See EPA's proposed approval of Minnesota's Regional Haze SIP, 77 FR 3689 (Jan. 25, 2012). EPA claims that Sherco is subject to Best Available Retrofit Technology requirements pursuant to 40 CFR 51.308 (the Regional Haze program) and also virtually identical Best Available Retrofit Technology requirements pursuant to 40 CFR 51.302 to 51.306 (the Reasonably Attributable Visibility Impairment program).
2. Capital costs taken from Xcel Energy, Resource Plan Update, Docket No E002/RP-10-825 before the Minnesota Public Utilities Commission, 1 December 2011, p 45, 46.
3. Annual costs taken from Minnesota Pollution Control Agency. BART Determination for Xcel Energy's Sherburne County Generating Plant, October 26, 2009.

Montana

1. "Re: Comments on Proposed Revision to Montana's Visibility Plan," correspondence from Bob Habeck, Montana Department of Environmental Quality to PPL Montana, February 17, 2012.
2. Capital costs and annual costs taken from EPA, "Approval and Promulgation of Implementation Plans; State of Montana; State Implementation Plan and Regional Haze Federal Implementation Plan," 77 FR 23988 (April 20, 2012): table 22 Summary of NO_x BART Analysis Comparison of Control Options for Ash Grove; table 51 Summary of NO_x BART Analysis Comparison of Control Options for Holcim; table 77

Summary of NOx BART Analysis Comparison of Control Options for Colstrip Unit 1; table 87 Summary of EPA SO₂ BART Analysis Comparison of Lime Injection and Lime Injection with an Additional Scrubber Vessel for Colstrip Unit 1; table 101 Summary of NOx BART Analysis Comparison of Control Options for Colstrip Unit 2; table 111 Summary of EPA SO₂ BART Analysis Comparison of Lime Injection and Lime Injection with an Additional Scrubber Vessel for Colstrip Unit 2.

3. Ibid. In 2005, Guidance for BART determinations, EPA established "presumptive limits" that represented "cost-effect" controls for Regional Haze compliance. For Ash Grove, Holcim, and Colstrip power station, EPA's NOx presumptive limits would require the installation of combustion controls (Low NOx Burners or Separated Overfire Air controls). For the Colstrip power station, EPA's SOx presumptive limits would require the installation of a lime injection system. These would cost \$6.4 million (data are compiled from the tables in the previous citation).

Nebraska

1. National Parks Conservation Association, Montana Environmental Information Center, Grand Canyon Trust, San Juan Citizens Alliance, Our Children's Earth Foundation, Plains Justice, Powder River Basin Resource Council, Sierra Club, and Environmental Defense Fund v. Lisa Jackson, Civil Action No. 1: 11-cv-01548 (ABJ).
2. See EPA's Regional Haze Proposed Federal Implementation Plan, 77 FR 12780 (Mar. 2, 2012).
3. See EPA's Technical Support Document for its proposed Regional Haze federal implementation plan for Nebraska, Appendix A, "EPA's evaluation of cost of Flue Gas Desulfurization (FGD) controls Nebraska Public Power District (NPDD) Gerald Gentleman Station (GGS), Units 1 and 2. EPA-R07-OAR-2012-0158-0023. Footnotes 5, 6, 7, 11, 13, and 25 are the cited sources for EPA's objections to Nebraska's cost-effectiveness analysis. Each footnote references EPA's cost-effectiveness analysis for Oklahoma's Regional Haze SIP. This analysis was performed by Dr. Phyllis Fox. See EPA-R06-OAR-2010-0190-0018, TSD Appendix C: Revised BART Cost-Effectiveness Analysis for Flue Gas Desulfurization at Coal-Fired Electric Generating Units in Oklahoma: Sooner Units 1 and 2, Muskogee Units 4 and 5, Northeastern Units 3 and 4. Final Report Revised 10-26-2010.
4. Annual cost achieved by multiplying emissions reductions at Gerald Gentleman Station required to meet EPA's "presumptive limits" for BART (39,185 tons per year of sulfur dioxide; see 77 FR 12780 (March 2, 2012)) times EPA's estimated 2012 price for a ton of sulfur dioxide on the emissions market established by the Cross State Air Pollution Rule (\$600).

New Mexico

1. In New Mexico, EPA used a putatively nondiscretionary Consent Decree deadline to actually ignore the state's Regional Haze submission. "We did receive a New Mexico RH SIP submittal on July 5, 2011, but it came several years after the statutory deadline, and after the close of the comment period on today's action. In addition, because of the missed deadline for the visibility transport, we are under a court-supervised consent decree deadline with WildEarth Guardians of August 5, 2011, to have either approved the New Mexico SIP or to have implemented a FIP to address the 110(a)(2)(D) (i) provision. It would not have been possible to review the July 5, 2011 SIP submission, propose a rulemaking, and promulgate a final action by the dates required by the consent decree." 76 FR 52390 (Aug. 22, 2011).
2. Capital costs and annual costs taken from New Mexico Environment Department Air Quality Bureau BART Determination for San Juan Generating Station, Units 1-4, February 28, 2011, table 10, "Impact Analysis and Cost-Effectiveness of Additional NOx Control Technologies."

3. See Exhibit 7t, "Rate Impact Analysis (February 11, 2011), New Mexico Environmental Department, Notice of Intent to Present Technical Testimony to the Environmental Improvement Board," May 2, 2011.

North Dakota

1. See state of North Dakota Comments on U.S. EPA Region 8 Approval and Promulgation of Implementation Plans; North Dakota Regional Haze State Implementation Plan; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Regional Haze, Docket No. EPA-R08-OAR-2010-0406, pages 41–66.
2. See 76 FR 58570, 58637 (Sept. 21, 2011) for EPA's reasoning.
3. The two power plants are the Coal Creek Station 2 and the Antelope Valley Station. For the Coal Creek Station, costs were determined based on the application of SNCR technology at \$3,198/ton NO_x removed and 2,678 tons NO_x removed/year. See 76 FR 58603. For the Antelope Valley Station, costs were taken from table 67, 76 FR 586266 (Sept. 21, 2011).
4. See *United States of America and state of North Dakota v. Minnkota Power Cooperative, Inc. and Square Butte Electric Cooperative*, Case No. 1:06-cv-034, Ruled December 21, 2011.
5. See footnote 24, 76 FR 16168, 16183 (Mar. 22, 2011), which notes that a review of the state's cost-effectiveness methodology was performed by Dr. Phyllis Fox. See also "Dr. Fox Resume," February 25, 2011, EPA-R06-OAR-2010-0190-0070, which establishes that she is a frequent litigation witness for environmentalist organizations. Four months after she was contracted by EPA to vet Oklahoma's cost-effective analyses for Regional Haze determinations, Fox was contracted by the Sierra Club to prepare comments pushing for the most stringent nitrogen oxides controls for Regional Haze at the Four Corner Power Plant on the Navajo Nation.
6. See OG&E comments to EPA Region 6 EPA-R06-OAR-2010-0190, page 6, "Dr. Fox's conclusions are unreliable because she lacks the knowledge, skill, experience, training, and education to proffer opinions on the projected costs and visibility impact of installing and operating scrubbers at the OG&E units. She has never designed, installed, or operated a scrubber and has never visited the OG&E Units."
7. See OG&E comments to EPA Region 6 EPA-R06-OAR-2010-0190, cover letter.

Oklahoma

1. Capital costs and annual costs taken from the Oklahoma Department of Environmental Quality Air Quality Division BART Application Analysis for the Muskogee Generating Station (table 10: Economic Cost for Units 4 and 5 – Dry FDG – Spray Dryer Absorber, p 17); the Sooner Generating Station (table 10: Economic Cost for Units 4 and 5 – Dry FDG – Spray Dryer Absorber, p 17); and the Northeastern Power Plant (table 11: Economic Cost for Units 4 and 5 – Dry FDG – Spray Dryer Absorber, p 14). These were three separate BART analyses that

Wyoming

1. EPA's Regional Haze proposed federal implementation plan, 77 FR 33022.

2. Ibid. Annual cost data compiled from: table 9 Summary of Jim Bridger Units 3 and 4 NOx BART Analysis—Costs per Boiler; tables 28-30, Summaries of Basin Electric Laramie River Units 1-3 NOx BART Analysis; table 31 Summary of Dave Johnston Unit 3 NOx BART Analysis; table 32 Summary of Jim Bridger Units 1 and 2 NOx BART Analysis—Costs per Boiler; table 33 Summary of Wyodak Unit 1 NOx BART Analysis.

3. Wyoming Department of Environmental Quality Response to BART Comments, Comment III.3, “Cumulative Modeled Impacts,” for BART analyses for Laramie River Station, Wyodak Plant, Dave Johnston Power Plant, Naughton Power Plant, and the Jim Bridger Power Plant, “EPA Region 8 commented that cumulative, modeled Class 1 impacts from all units at a facility (or combined impacts from multiple facilities) should be presented in addition to results for individual units.” See also, Wyoming Department of Environmental Quality Response to BART Comments, Comment III.12 “NOx Controls” for Wyodak Plant, “A Revised cost analysis should indicate that SCR [selective catalytic reduction] is cost-effective at Wyodak.” See also, Wyoming Department of Environmental Quality Response to BART Comments, Comment III.12, “NOx Controls,” for Laramie River Station, “If such a limit [as achieved by Selective Catalytic Reduction retrofits at the plant] is achievable at LRS, it should be required as BART.” In all Wyoming Department of Environmental Quality Response to BART Comments, comment III.12, “NOx Controls,” indicates EPA’s preference that Selective Catalytic Reduction controls be required for Regional Haze. In each case, the State chose a different, less stringent technology.

Appendix B: Methodology for Case Study Photos

Winhaze 2.9.9 Software was used to create images depicting the visibility improvement engendered by both EPA's and the states' preferred controls. Winhaze is a computer imaging software program that simulates visual air quality differences in various National Parks and Wilderness Areas. Users can select a scene and then model the visibility that corresponds to an input value, of which there are three: extinction, visual range, and deciview. For Regional Haze modeling, deciview is the standard metric of visibility improvement. Winhaze is available for free at [ftp://ftp.air-resource.com/WINHAZE](http://ftp.air-resource.com/WINHAZE).

According to EPA, "a one deciview change in haziness is a small but noticeable change in haziness under most circumstances when viewing scenes in a Class 1 Area."¹ This finding, however, is disputed by academic research. A 2005 peer-reviewed journal article suggests that there is only a 17%–35% chance of a person perceiving a one deciview change.²

A 2010 journal article found that the shutdown of the 1,500 megawatt Mohave Generating Station caused no perceptible improvement in visibility at the Grand Canyon National Park, despite the fact that it was only 50 miles away.³ This suggests that even drastic reductions in visibility-impairing emissions might not perceptibly improve visibility.

The following inputs were used to generate the Winhaze images for the state case studies.

Winhaze 2.9.9 Inputs:

Arizona

- Maximum impacted Class 1 area: Canyonlands National Park, Utah⁴
- Baseline visibility: 10.17⁵
- Improvement engendered by EPA controls: 1.12⁶
- Improvement engendered by state controls: .51⁷
- Maximum visibility impact modeled at Grand Canyon National Park, Arizona

Minnesota

- Maximum impacted Class 1 area: Boundary Waters Canoe Area, Minnesota
- Baseline visibility: 16.1⁸
- Improvement engendered by EPA controls: .88⁹
- Improvement engendered by state controls: .57¹⁰

Montana

- Maximum impacted Class 1 area: Gates of the Mountains Wilderness Area, Montana
- Baseline visibility: 11.29¹¹
- Improvement engendered by EPA controls: 1.67¹²
- Improvement engendered by Montana controls: 0¹³
- Maximum visibility impact modeled at Cabinet Mountains Wilderness Area, Montana.

Nebraska

- Maximum impacted Class 1 area: Badlands National Park, South Dakota
- Baseline visibility: 15.9¹⁴
- Improvement engendered by EPA controls: .86¹⁵
- Improvement engendered by state controls: baseline

New Mexico

- Maximum impacted Class 1 area: Mesa Verde
- Baseline visibility: 10.9¹⁶
- Improvement engendered by EPA controls: 1.34¹⁷
- Improvement engendered by state controls: .22¹⁸
- Maximum visibility impact modeled at White Mountain Wilderness Area, New Mexico

North Dakota

- Maximum impacted Class 1 area: Theodore Roosevelt National Park North Unit, North Dakota
- Baseline visibility: 17.0¹⁹
- Improvement engendered by EPA controls: 1.77²⁰
- Improvement engendered by state controls: 1.7²¹

Oklahoma

- Maximum impacted Class 1 area: Wichita Mountains Wildlife Refuge, Oklahoma
- Baseline visibility: 23.1²²
- Improvement engendered by EPA controls: 2.89²³
- Improvement engendered by state controls: baseline

Wyoming

- Maximum impacted Class 1 area: Wind Cave National Park, South Dakota
- Baseline visibility: 15.2²⁴
- Improvement engendered by EPA controls: 2.3²⁵
- Improvement engendered by state controls: 1.26²⁶
- Maximum visibility impact modeled at Snowy Range Scenic Byway, Wyoming.

Endnotes

1. 74 FR 44327.
2. Ronald Henry (2005), "Estimating the Probability of the Public Perceiving a Decrease in Atmospheric Haze," *Journal of the Air and Waste Management Association*, Vol. 55 No. 11 p 1760.
3. Terhorst and Berkman (2010) "Effect of Coal-Fired Power Generation on Visibility in a Nearby National Park," *Atmospheric Environment*, Vol. 44 p 2524.
4. For all state case studies, "maximum impacted Class 1 area" was identified as the National Park or Wilderness Area for which there was the greatest discrepancy in visibility improvement between EPA's controls and the state's controls.
5. Baseline data for 20% worst visibility days at Canyonlands NP were derived from IMPROVE observations for the worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website (<http://vista.cira.colostate.edu/Views/>).
6. Visibility improvement data taken from table 34, "Visibility Impacts 98th Percentile DV of NGS on Eleven Class 1 Areas As Modeled by SRP 74 FR 44332.
7. Ibid.
8. Baseline data for 20% worst visibility days at Boundary Waters Canoe Area was derived from IMPROVE observations for the Worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) web site.
9. Taken from table 5, "Visibility Impacts," Minnesota Pollution Control Agency BART Determination for Xcel Energy's Sherburne County Generating Station.
10. Ibid.
11. Capital costs and annual costs taken from EPA, "Approval and Promulgation of Implementation Plans; State of Montana; State Implementation Plan and Regional Haze Federal Implementation Plan," 77 FR 23988, (April 20, 2012), table 6. Summary of Uniform Rate of Progress for 20% Worst Days, 77 FR 23997.
12. Ibid, table 22. Summary of NOx BART Analysis Comparison of Control Options for Ash Grove, 77 FR 24007; table 50. Delta Deciview Improvement for NOx Controls on Holcim, 77 FR 24017.
13. Montana ceded control of its Regional Haze program to EPA in 2006.
14. Baseline data for 20% worst visibility days at Badlands National Park were derived from IMPROVE observations for the worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website.
15. Visibility improvement over baseline for Badlands National Park taken from 77 FR 12780.
16. Baseline data for 20% worst visibility days at Mesa Verde NP were derived from IMPROVE observations for the worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website.
17. Visibility improvement data taken from table 6, "NMED Modeled Maximum Impacts of the 98th Percentile Delta-dv Impacts from 2001–2003," 76 FR 502.
18. Ibid.
19. Baseline data for 20% worst visibility days at Theodore Roosevelt National Park were derived from IMPROVE observations for the worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website.
20. Visibility improvement data taken from North Dakota Regional Haze BART submittal by Great River Energy for Coal Creek Stations 1, 2 (GRE's modeling data were approved by North Dakota) table 7-4 "Year 2000 Modeling Results"; Visibility improvement data for Antelope Valley Station were taken from state of North Dakota, Comments on U.S. EPA Region 8 Approval and Promulgation of Implementation Plans; North Dakota Regional Haze State Implementation Plan; Federal Implementation Plan for Interstate Transport of Pollution Affecting Visibility and Regional Haze," p 67.
21. Ibid.
22. Baseline data for 20% worst visibility days at Wichita Mountains National Park were derived from IMPROVE observations for the worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website.
23. Visibility improvement data taken from EPA's proposed Regional Haze federal implementation plan for Oklahoma, table 9, "EPA Modeled Maximum Impacts Due To Dry Scrubbing of the 98th Percentile Delta-DV Impacts from 2001–2003," 76 FR 16186.
24. Baseline data for 20% worst visibility days at Wind Cave National Park were derived from IMPROVE observations for the Worst 20% days in 2004, as obtained from the Visibility Information Exchange Web System (VIEWS) website.
25. Visibility improvement data taken from EPA, proposed Regional Haze federal implementation plan for Wyoming, 77 FR 33022, table 9 Summary of Jim Bridger Units 3 and 4 NOx BART Analysis—Costs per Boiler; tables 28-30 Summaries of Basin Electric Laramie River Units 1-3 NOx BART Analysis; table 31 Summary of Dave Johnston Unit 3 NOx BART Analysis; table 32 Summary of Jim Bridger Units 1 and 2 NOx BART Analysis—Costs per Boiler; table 33 Summary of Wyodak Unit 1 NOx BART Analysis.
26. Ibid.

CONSENT DECREE

This Consent Decree is entered into by Plaintiffs National Parks Conservation Association, Montana Environmental Information Center, Grand Canyon Trust, San Juan Citizens Alliance, Our Children's Earth Foundation, Plains Justice, Powder River Basin Resource Council, Sierra Club, and Environmental Defense Fund ("Plaintiffs"), and by Defendant Lisa Jackson, in her official capacity as Administrator of the United States Environmental Protection Agency ("EPA" or "the Administrator").

WHEREAS, Section 110(c) of the Clean Air Act, 42 U.S.C. § 7410(c), requires the Administrator of EPA to promulgate a federal implementation plan ("FIP") within two years of a finding that a state has failed to make a required a state implementation plan ("SIP") submittal. The pertinent provision of Section 110(c) states:

(1) The Administrator shall promulgate a Federal implementation plan at any time within 2 years after the Administrator—

(A) finds that a State has failed to make a required submission or finds that the plan or plan revision submitted by the State does not satisfy the minimum criteria established under section 110(k)(1)(A).

WHEREAS, on January 15, 2009, EPA found that the following 34 States¹ had failed to submit Clean Air Act SIPs addressing any of the required regional haze SIP elements of 40

C.F.R. § 51.308: Alaska, California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Texas, Vermont, U.S. Virgin Islands, Virginia,

Washington, and Wisconsin. 74 Fed. Reg. 2392, 2393 (Jan. 15, 2009);

WHEREAS, on January 15, 2009 EPA also found that the following five states had submitted some, but not all, of the required regional haze SIP elements set forth at 40 C.F.R. §§ 51.308 and 51.309: Arizona—40 C.F.R. § 51.309(g) and 40 C.F.R. § 51.309(d)(4); Colorado—40 C.F.R. § 51.308(d) and 40 C.F.R. § 51.308(e) for two sources; Michigan—40 C.F.R. § 51.308(d) and 40 C.F.R. § 51.308(e) for six sources; New Mexico—40 C.F.R. § 51.309(g) and 40 C.F.R. § 51.309(d)(4); Wyoming—40 C.F.R. § 51.309(g). 74 Fed. Reg. at 2393;

WHEREAS, on January 15, 2009, EPA stated that its finding “starts the two-year clock for the promulgation by EPA of a FIP. EPA is not required to promulgate a FIP if the state makes the required SIP submittal and EPA takes final action to approve the submittal within two years of EPA’s finding.” 74 Fed. Reg. at 2393;

WHEREAS, EPA did not, by January 15, 2011, promulgate regional haze FIPs or approve regional haze SIPs for any of the 34 states for which it found on January 15, 2009 a 1 Throughout this Consent Decree, the term “state” or “State” has the meaning provided in 42 U.S.C. § 7602(d). failure to submit SIPs addressing any of the required regional haze SIP elements, and EPA also did not, by January 15, 2011, promulgate regional haze FIPs or approve regional haze SIPs correcting the non-submittal deficiencies that EPA found on January 15, 2009 with respect to the regional haze SIP requirements for Arizona, Colorado, Michigan, New Mexico and Wyoming;

WHEREAS to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA’s regional haze regulations the following states (and one region) submitted regional haze SIPs to EPA prior to January 15, 2009 (hereinafter, “regional haze SIP submittals”), and whereas EPA has yet to take final action on such submittals pursuant to 42

U.S.C. 7410(k): Alabama; Albuquerque, NM; Iowa; Louisiana; Mississippi; Missouri; North Carolina; South Carolina; Tennessee; and West Virginia;

WHEREAS, Plaintiffs served prior notice on the Administrator alleging that her failure to promulgate regional haze FIPs and take final action on regional haze SIPs as described above constituted failure to perform duties that are not discretionary under the Act, and of Plaintiffs’ intent to initiate the present action. This notice was provided via certified letters, posted January 19, 2011, and addressed to the Administrator;

WHEREAS, Plaintiffs filed a complaint pursuant to CAA section 304(a)(2), 42 U.S.C. § 7604(a)(2), alleging failure by the Administrator to perform nondiscretionary duties as referenced above;

WHEREAS, Plaintiffs and EPA (collectively, the “Parties”) wish to effectuate a settlement of the above-captioned cases without expensive and protracted litigation, and without a litigated resolution of any issue of law or fact;

WHEREAS, the Parties consider this Consent Decree to be an adequate and equitable resolution of the claims in the above-captioned case and consent to entry of this Consent Decree; and

WHEREAS, the Court, by entering this Consent Decree, finds that this Consent Decree is fair, reasonable, in the public interest, and consistent with the CAA, 42 U.S.C. §§ 7401 et seq.

NOW THEREFORE, before the taking of testimony, without trial or determination of any issue of fact or law, and upon the consent of the Parties, it is hereby ORDERED, ADJUDGED, and DECREED that:

1. This Court has subject matter jurisdiction over the claims set forth in the Complaint and to order the relief contained in this Consent Decree.
2. Venue is proper in the United States District Court for the District of Columbia.

Resolution of Claims

3. By the “Proposed Promulgation Deadlines” set forth in Table A below EPA shall sign a notice(s) of proposed rulemaking in which it proposes approval of a SIP promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP

- or approval of a SIP or promulgation of a FIP in the alternative, for each State therein, that collectively meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
4. By the "Final Promulgation Deadlines" set forth in Table A below, EPA shall sign a notice(s) of final rulemaking promulgating a FIP for each State therein to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.

TABLE A

Deadlines for EPA to Sign Notice of Promulgation for Proposed and Final Regional Haze FIPs and/or Approval of SIPs ("RH" = Regional Haze)

Proposed Promulgation Deadlines	Final Promulgation Deadlines	State
	December 13, 2011	Nevada Oklahoma (all BART elements)
	December 15, 2011	Kansas New Jersey
November 15, 2011	March 15, 2012	District of Columbia Maine
November 29, 2011	March 29, 2012	South Dakota
January 17, 2012	May 15, 2012	Minnesota Illinois Indiana New York Ohio Pennsylvania Virginia
February 15, 2012	June 15, 2012	Alaska (all BART elements) Georgia Maryland Nebraska New Hampshire New Mexico(all remaining RH SIP elements) Rhode Island Vermont Wisconsin
March 15, 2012	July 13, 2012	Connecticut Massachusetts
May 14, 2012	September 14, 2012	Hawaii Virgin Islands
May 15, 2012	November 15, 2012	Alaska (all remaining RH SIP elements) Arizona Idaho (all remaining RH SIP elements) Florida Michigan Oklahoma (all remaining RH SIP elements) Oregon (all remaining RH SIP elements) Texas Washington

5. By the "Proposed Promulgation Deadlines" set forth in Table B below EPA shall sign a notice of proposed rulemaking in which it proposes to approve or disapprove, in accordance with 42 U.S.C. § 7410(k), the regional haze SIP submittals for each state or area indicated.
6. By the "Final Promulgation Deadlines" set forth in Table B below, EPA shall sign a notice of final rulemaking in which it approves or disapproves, in accordance with 42 U.S.C. § 7410(k), the regional haze SIP submittals for each state or area indicated.

TABLE B

Deadlines for EPA to Sign Notices of Promulgation for Proposed and Final Approval or Disapproval of Regional Haze SIP Submissions

Proposed Promulgation Deadlines	Final Promulgation Deadlines	State or Area
February 15, 2012	March 15, 2012	Tennessee West Virginia
	June 15, 2012	Alabama Albuquerque, NM Iowa Louisiana Mississippi Missouri North Carolina South Carolina

General Provisions

7. The deadlines in Table A or B may be extended for a period of 60 days or less by written stipulation executed by counsel for EPA and Plaintiffs and filed with the Court. Any other extension of a deadline in Table A or B may be approved by the Court upon motion made pursuant to the Federal Rules of Civil Procedure by EPA and upon consideration of any response by Plaintiffs and reply by EPA.
8. EPA agrees that Plaintiffs are entitled to recover their costs of litigation (including attorneys' fees) ("litigation costs") incurred in this matter pursuant to 42 U.S.C. § 7604(d). The deadline for the filing of any motion for litigation costs for activities performed prior to the lodging of this decree with the Court is hereby extended for a period of 120 days. During this time the Parties shall seek to resolve informally any claim for litigation costs, and if they cannot reach a resolution, Plaintiffs may seek such litigation costs from the Court. The Court shall retain jurisdiction to resolve any request for litigation costs. Plaintiffs reserve their right to seek litigation costs for any work performed after the lodging of this Consent Decree. EPA does not concede that Plaintiffs will be entitled to fees for any work performed after the lodging of the Consent Decree, and the parties reserve all claims and defenses with respect to any future costs of litigation claim.
9. No later than ten business days following signature by the Administrator or her delegatee of the notice of any proposed or final rulemaking referenced above, EPA shall deliver the notice to the Office of the Federal Register for review and prompt publication. Following such delivery to the Office of the Federal Register, EPA shall not take any action (other than is necessary to correct any typographical errors or other errors in form) to delay or otherwise interfere with publication of such notice in the Federal Register. EPA shall make available to Plaintiffs copies of the notices referenced herein within five business days following signature by the Administrator or her delegatee.
10. Plaintiffs and EPA shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.
11. Nothing in this Consent Decree shall be construed to limit or modify any discretion accorded EPA by the CAA or by general

principles of administrative law in taking the actions which are the subject of this Consent Decree, including the discretion to alter, amend, or revise any responses or final actions contemplated by this Consent Decree. EPA's obligation to perform the actions specified by Paragraphs 3 through 6 does not constitute a limitation or modification of EPA's discretion within the meaning of this paragraph.

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12. Nothing in this Consent Decree shall be construed as an admission of any issue of fact or law or to waive or limit any claim or defense, on any grounds, related to any final action EPA may take with respect to the SIPs or FIPs identified in paragraphs 3 through 6 of this Consent Decree.
13. Nothing in this Consent Decree shall be construed to confer upon the district court jurisdiction to review any final decision made by EPA pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to confer upon the district court jurisdiction to review any issues that are within the exclusive jurisdiction of the United States Court of Appeals pursuant to 42 U.S.C. §§ 7607(b)(1) and 7661d. Nothing in this Consent Decree shall be construed to waive any remedies or defenses the Parties may have under 42 U.S.C. § 7607(b)(1).
14. The Parties recognize and acknowledge that the obligations imposed upon EPA under this Consent Decree can only be undertaken using appropriated funds legally available for such purpose. No provision of this Consent Decree shall be interpreted as or constitute a commitment or requirement that EPA obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.
15. Any notices required or provided for by this Consent Decree shall be made in writing and sent via e-mail to the following:
 16. In the event of a dispute among the Parties concerning the interpretation or implementation of any aspect of this Consent Decree, the disputing Party shall provide the other Party with a written notice outlining the nature of the dispute and requesting informal negotiations. If the Parties cannot reach an agreed-upon resolution, any Party may move the Court to resolve the dispute.
 17. No motion or other proceeding seeking to enforce this Consent Decree or for contempt of court shall be properly filed unless the Party seeking to enforce this Consent Decree has followed the procedure set forth in Paragraph 16.
 18. The Court shall retain jurisdiction to determine and effectuate compliance with this Consent Decree, to resolve any disputes thereunder, and to consider any requests for costs of litigation (including reasonable attorneys' fees). After EPA's obligations under Paragraphs 3 through 6 have been completed, EPA may move to have this consent decree terminated. Plaintiffs shall have 14 days in which to respond to such motion.
 19. The Parties agree and acknowledge that before this Consent Decree can be finalized and entered by the Court, EPA must provide notice in the Federal Register and an opportunity for comment pursuant to 42 U.S.C. § 7413(g). EPA will deliver a public notice of this Consent Decree to the Federal Register for publication and public comment within 10 business days after lodging this Consent Decree with the Court. After this Consent Decree has undergone

an opportunity for notice and comment, EPA's Administrator and the Attorney General, as appropriate, will promptly consider any such written comments in determining whether to withdraw or withhold consent to this Consent Decree, in accordance with section 113(g) of the Clean Air Act. If the Administrator or the Attorney General elects not to withdraw or withhold consent to this Consent Decree, the Parties will promptly file a motion that requests the Court to enter this Consent Decree. If a motion to enter the Consent Decree is not filed within 60 days after the notice is published in the Federal Register, any party may file dispositive motions in this matter.

20. It is hereby expressly understood and agreed that this Consent Decree was jointly drafted by the Parties and that any and all rules of construction to the effect that ambiguity is construed against the drafting party shall be inapplicable in any dispute concerning the terms, meaning, or interpretation of this Consent Decree.
21. The undersigned certify that they are fully authorized by the Party or Parties they represent to bind that Party or those Parties to the terms of this Consent Decree.

SO ORDERED this ____ day of _____, 2011.

HON. AMY BERMAN JACKSON
United States District Judge

SO AGREED:

FOR PLAINTIFFS:

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UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLUMBIA

SIERRA CLUB,)	
)	
Plaintiff,)	
)	
v.)	
)	
LISA JACKSON, in her official)	
capacity as Administrator, United States)	
Environmental Protection Agency,)	
)	
Defendant.)	
)	

Case: 1:10-cv-02112-JEB

CONSENT DECREE

WHEREAS, Plaintiff Sierra Club filed this action pursuant to section 304(a)(2) of the Clean Air Act ("CAA"), 42 U.S.C. § 7604(a)(2), alleging that Defendant Lisa Jackson, Administrator of the United States Environmental Protection Agency ("EPA"), failed to timely perform a duty mandated by CAA section 110(k)(2) and (3), id. §§ 7410(k)(2) and (3), to approve or disapprove (or approve in part and disapprove in part) the state implementation plan ("SIP") revision dated July 29, 2008, submitted by Arkansas to EPA (referred to as "Arkansas Regional Haze SIP").

WHEREAS, Plaintiff and EPA (collectively the "Parties") wish to effectuate a settlement of the above-captioned case without expensive and protracted litigation.

WHEREAS, the Parties consider this Decree to be an adequate and equitable resolution of the claims in the above-captioned case.

WHEREAS, the Court, by entering this Decree, finds that this Decree is fair, reasonable, in the public interest, and consistent with the CAA, 42 U.S.C. §§ 7401 et seq.

NOW THEREFORE, before the taking of testimony, without trial or determination of any issue of fact or law, and upon the consent of the Parties, it is hereby ORDERED, ADJUDGED and DECREED that:

1. This Court has subject matter jurisdiction over the claims set forth in the Complaint related to the Arkansas Regional Haze SIP and to order the relief contained in this Decree. Venue is proper in the United States District Court for the District of Columbia.
2. By December 15, 2011, EPA shall sign a notice of final rulemaking in which it shall approve or disapprove, in accordance with CAA section 110(k), 42 U.S.C. § 7410(k), the Arkansas Regional Haze SIP. EPA shall expeditiously deliver the notice of final rulemaking to the Office of the Federal Register for publication and shall provide a copy of the notice of final rulemaking to Plaintiff within ten (10) days after signature.
3. The Parties agree that Plaintiff is entitled to recover costs of litigation (including attorneys' fees) incurred in this matter pursuant to CAA section 304(d), 42 U.S.C. § 7604(d). The deadline for filing a motion for costs of

litigation (including attorney's fees) for activities performed prior to entry of this Consent Decree in this case is hereby extended until ninety (90) days after entry of this Consent Decree by the Court. During this time the Parties shall seek to resolve informally any claim for costs of litigation (including attorney's fees), and if they cannot, will submit that issue to the Court for resolution.

4. The deadline in paragraph 2 of this Decree may be extended for a period of ninety (90) days or less by written stipulation executed by counsel for Plaintiff and EPA which shall be filed with the Court. Any other extension of the deadline in paragraph 2 of this Decree may be approved by the Court upon a motion of EPA, made pursuant to the Federal Rules of Civil Procedure, and upon consideration of any response by Plaintiff. Any other provision of this Consent Decree may be modified by the Court following motion of Plaintiff or EPA pursuant to the Federal Rules of Civil Procedure and upon consideration of any opposition by the non-moving party.
5. Plaintiff and EPA shall not challenge the terms of this Decree or this Court's jurisdiction to enter and enforce this Decree.
6. Nothing in this Decree shall be construed to limit or modify any discretion accorded EPA by the CAA or by general principles of administrative law in taking the action which is the subject of this Decree, including the discretion to alter, amend or revise any final action contemplated by this Decree. EPA's obligation to perform the actions specified in paragraph 2 by the time specified therein does not constitute a limitation or modification of EPA's discretion within the meaning of this paragraph.
7. Nothing in this Decree shall be construed as an admission of any issue of fact or law nor to waive or limit any claim or defense, on any grounds, related to any final action EPA may take with respect to the Arkansas Regional Haze SIP.
8. Nothing in this Decree shall be construed to confer upon the district court jurisdiction to review any final decision made by EPA pursuant to this Decree. Nothing in this Decree shall be construed to confer upon the district court jurisdiction to review any issues that are within the exclusive jurisdiction of the United States Courts of Appeals pursuant to CAA sections 307(b)(1), 42 U.S.C. § 7607(b)(1). Nothing in this Decree shall be construed to waive any remedies or defenses the Parties may have under CAA section 307(b)(1).
9. The Parties recognize and acknowledge that the obligations imposed upon EPA under this Decree can only be undertaken using appropriated funds legally available for such purpose. No provision of this Decree shall be interpreted as or constitute a commitment or requirement that the United States obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.
10. Any notices required or provided for by this Decree shall be made in writing, via facsimile, email, or other means, and sent to the following:

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11. In the event of a dispute between the Parties concerning the interpretation or implementation of any aspect of this Decree, the disputing Party shall provide the other Party with a written notice outlining the nature of the dispute and requesting informal negotiations. If the Parties cannot reach an agreed-upon resolution within ten (10) business days after receipt of the notice, any party may move the Court to resolve the dispute.

12. No motion or other proceeding seeking to enforce this Decree or for contempt of Court shall be properly filed unless Plaintiff has followed the procedure set forth in paragraph 11, and provided EPA with written notice received at least ten (10) business days before the filing of such motion or proceeding.

13. The Court shall retain jurisdiction to determine and effectuate compliance with this Decree.

After EPA has completed the relevant actions set forth in paragraph 2 of this Consent Decree, any relevant notices have been published in the Federal Register, and any claim for costs of litigation, including attorneys' fees, has been resolved, EPA may move to have this Decree terminated. Plaintiff shall have fourteen (14) days in which to respond to such motion.

14. The Parties agree and acknowledge that before this Consent Decree can be finalized and entered by the Court, EPA must provide notice in the Federal Register and an opportunity for comment pursuant to CAA section 113(g), 42 U.S.C. § 7413(g). EPA will submit a public notice of this Consent Decree to the Federal Register for publication and public comment within ten (10) days after lodging this Consent Decree with the Court. After this Consent Decree has undergone an opportunity for notice and comment, the Administrator and the Attorney General, as appropriate, will promptly consider any such written comments in determining whether to withdraw or withhold consent to this Consent Decree, in accordance with section 113(g) of the CAA. If the Administrator or the Attorney General elects not to withdraw or withhold consent to this Consent Decree, the Parties will promptly file a motion that requests the Court to enter this Consent Decree.

15. The undersigned representatives of each Party certify that they are fully authorized by the Party they represent to bind that Party to the terms of this Decree.

SO ORDERED this ____ day of _____ 2011.

 JUDGE JAMES E. BOASBERG
 UNITED STATES DISTRICT JUDGE

SO AGREED:

FOR PLAINTIFF

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FOR DEFENDANT

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IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLORADO

Civil Action No. 1:11-cv-0001-CJA-MEH (Consolidated with 11-cv-00743-CMA-MEH) WILDEARTH GUARDIANS,

Plaintiffs,

v.

LISA JACKSON, in her official capacity as Administrator, United States Environmental Protection Agency,

Defendant.

not acting on a Wyoming SIP submission addressing Wyoming regional haze, and duties mandated by CAA section 110(c), 42 U.S.C. § 7410(c), to promulgate regional haze Federal Implementation Plans ("FIPs") for Montana, North Dakota, Colorado and Wyoming. The amended complaint further sought to compel EPA to take final action on these regional haze matters by a date certain;

WHEREAS, the Environmental Defense Fund ("EDF") filed a complaint pursuant to CAA section 304(a)(2), 42 U.S.C. § 7604(a)(2), alleging that EPA failed to perform a duty mandated by CAA section 110(c), 42 U.S.C. § 7410(c), to promulgate a regional haze FIP for the State of Colorado or, alternatively, to finally approve a regional haze SIP for the State of Colorado;

CONSENT DECREE

This Consent Decree is entered into by Plaintiffs WildEarth Guardians ("Guardians"), National Parks Conservation Association ("NPCA"), and the Environmental Defense Fund ("EDF"), and by Defendant Lisa Jackson, in her official capacity as Administrator of the United States Environmental Protection Agency ("EPA").

WHEREAS, Guardians filed this action pursuant to section 304(a)(2) of the Clean Air Act ("CAA"), 42 U.S.C. § 7604(a)(2), alleging that EPA failed to perform a duty mandated by CAA section 110(k)(2) and (3), 42 U.S.C. § 7410(k)(2) and (3), by not acting on two State Implementation Plan ("SIP") submissions, one addressing Colorado regional haze and the other addressing North Dakota excess emissions during startup, shutdown, malfunction and maintenance. The complaint further sought to compel EPA to take final action on these submissions by a date certain;

WHEREAS, Guardians and NPCA filed an amended complaint pursuant to CAA section 304(a)(2), 42 U.S.C. § 7604(a)(2), alleging additional claims that EPA failed to perform a duty mandated by CAA section 110(k)(2) and (3), 42 U.S.C. § 7410(k)(2) and (3), by

WHEREAS, Guardians, NPCA, EDF and EPA (collectively, the "Parties") wish to effectuate a settlement of the above-captioned cases without expensive and protracted litigation, and without a litigated resolution of any issue of law or fact;

WHEREAS, the Parties consider this Consent Decree to be an adequate and equitable resolution of the claims in the above-captioned case and consent to entry of this Consent Decree; and

WHEREAS, the Court, by entering this Consent Decree, finds that this Consent Decree is fair, reasonable, in the public interest, and consistent with the CAA, 42 U.S.C. §§ 7401 et seq.

NOW THEREFORE, before the taking of testimony, without trial or determination of any issue of fact or law, and upon the consent of the Parties, it is hereby ORDERED, ADJUDGED, and DECREED that:

1. This Court has subject matter jurisdiction over the claims set forth in the Amended Complaint and the EDF Complaint and to order the relief contained in this Consent Decree.

2. Venue is proper in the United States District Court for the District of Colorado.

Resolution of Claim Asserted Solely by Guardians

3. By October 27, 2011, or within 20 days after the entry date of this Consent Decree, whichever date is later, EPA shall sign a notice of final rulemaking in which it takes final action on the State of North Dakota's revisions to Chapters 33-15-01 and 33-15-05, N.D.A.C., that North Dakota submitted to EPA on April 6, 2009. Such final action may consist of an approval, disapproval, limited approval/limited disapproval, partial approval/partial disapproval, or any combination thereof, as long as EPA takes final action on the entirety of the specified rule revisions.

Resolution of Claims Asserted by Guardians and NPCA

4. By July 21, 2011, or within 20 days after the entry date of this Consent Decree, whichever date is later, EPA shall sign a notice of proposed rulemaking in which it proposes approval of a SIP, promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP or approval of a SIP or promulgation of a FIP in the alternative, for the State of North Dakota, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
5. EPA shall by January 26, 2012, sign a notice of final rulemaking promulgating a FIP for the State of North Dakota, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations, unless, by January 26, 2012, EPA has signed a notice of final rulemaking unconditionally approving a SIP, or promulgating a partial FIP and partial unconditional approval of a SIP, for the State of North Dakota that meets the regional haze implementation plan requirements that were

due by December 17, 2007 under EPA's regional haze regulations.

6. By April 15, 2012, EPA shall sign a notice of proposed rulemaking in which it proposes approval of a SIP, promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP, or approval of a SIP or promulgation of a FIP in the alternative, for the State of Wyoming, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
7. EPA shall by October 15, 2012, sign a notice of final rulemaking promulgating a FIP for the State of Wyoming, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations, unless, by October 15, 2012, EPA has signed a notice of final rulemaking unconditionally approving a SIP, or promulgating a partial FIP and partial unconditional approval of a SIP, for the State of Wyoming that meets the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
8. By January 20, 2012, EPA shall sign a notice of proposed rulemaking in which it proposes approval of a SIP, promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP, or approval of a SIP or promulgation of a FIP in the alternative, for the State of Montana, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
9. EPA shall by June 29, 2012, sign a notice of final rulemaking promulgating a FIP for the State of Montana, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations, unless, by June 29, 2012, EPA has signed a notice of final rulemaking unconditionally approving a SIP, or promulgating a partial FIP and partial unconditional approval of a SIP, for the State of Montana that meets the regional haze implementation plan

requirements that were due by December 17, 2007 under EPA's regional haze regulations.

Resolution of Claims Asserted by Guardians, NPCA and EDF

10. By March 8, 2012, EPA shall sign a notice of proposed rulemaking in which it proposes approval of a SIP, promulgation of a FIP, partial approval of a SIP and promulgation of a partial FIP, or approval of a SIP or promulgation of a FIP in the alternative, for the State of Colorado, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.
11. EPA shall by September 10, 2012, sign a notice of final rulemaking promulgating a FIP for the State of Colorado, to meet the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations, unless, by September 10, 2012, EPA has signed a notice of final rulemaking unconditionally approving a SIP or promulgating a partial FIP and partial unconditional approval of a SIP for the State of Colorado that meets the regional haze implementation plan requirements that were due by December 17, 2007 under EPA's regional haze regulations.

General Provisions

12. The deadline in Paragraph 3 may be extended for a period of 60 days or less by written stipulation executed by counsel for EPA and Guardians and filed with the Court. Any other extension of a deadline in paragraph 3 may be approved by the Court upon motion made pursuant to the Federal Rules of Civil Procedure by EPA and upon consideration of any response by Guardians and reply by EPA. The deadlines in Paragraphs 4 through 9 may be extended for a period of 60 days or less by written stipulation executed by counsel for EPA, Guardians and NPCA and filed with the Court. Any other extension of a deadline in paragraphs 4 through 9 may be approved by the Court upon motion made pursuant to the

Federal Rules of Civil Procedure by EPA and upon consideration of any response by Guardians and NPCA, and reply by EPA. The deadlines in Paragraphs 10 and 11 may be extended for a period of 60 days or less by written stipulation executed by counsel for EPA, Guardians, NPCA, and EDF and filed with the Court. Any other extension of a deadline in paragraphs 10 and 11 may be approved by the Court upon motion made pursuant to the Federal Rules of Civil Procedure by EPA and upon consideration of any response by Guardians, NPCA and EDF, and reply by EPA. Any other modification of this Consent Decree may be approved by the Court upon motion made pursuant to the Federal Rules of Civil Procedure by any Party to this Consent Decree and upon consideration of any response by the non-moving Parties and reply by the moving party.

13. The United States agrees to pay Guardians as full settlement of all claims by Guardians for attorneys' fees, costs, and expenses ("costs of litigation") incurred in this consolidated litigation through the date of lodging this consent decree, under any authority, the sum of \$23,545 as soon as reasonably practicable following entry of this Consent Decree, by electronic funds transfer to a bank account identified by Guardians. Guardians agrees that the United States' payment to Guardians of \$23,545 fully satisfies any and all claims for costs of litigation Guardians may have with respect to these consolidated cases, except that Guardians reserves the right to seek costs of litigation pursuant to 42 U.S.C. §7604(d) for any additional work performed after the lodging of this Consent Decree. The costs of litigation paid under this Paragraph shall have no precedential value in any future claim. Guardians will not seek costs of litigation incurred between February 22, 2011 and the date of lodging this consent decree in Case No. 09-cv-02148-REB-MJW (D. Colo.). NPCA does not seek costs of litigation related to its claims in these consolidated cases for work performed through the date of lodging this Consent Decree. NPCA reserves its right to seek costs of litigation pursuant

to 42 U.S.C. § 7604(d) for any work performed after the lodging of this Consent Decree. EDF, which filed a separate complaint in this matter, does not seek costs of litigation related to its claims in these consolidated cases for work performed before or after the lodging of this Consent Decree. EPA does not concede that Guardians or NPCA will be entitled to fees for any work performed by Guardians or NPCA after the lodging of the Consent Decree, and EPA reserves all defenses with respect to any future costs of litigation claim.

14. No later than ten business days following signature of the notice of any proposed or final rulemaking referenced above, EPA shall submit the notice for review and publication to the Office of the Federal Register. Following such delivery to the Office of the Federal Register, EPA shall not take any step to delay or otherwise interfere with publication of such notice in the Federal Register.
15. Guardians, NPCA, EDF and EPA shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree.
16. Nothing in this Consent Decree shall be construed to limit or modify any discretion accorded EPA by the CAA or by general principles of administrative law in taking the actions which are the subject of this Consent Decree, including the discretion to alter, amend, or revise any responses or final actions contemplated by this Consent Decree. EPA's obligation to perform the actions specified by Paragraphs 3 through 11 by the times specified does not constitute a limitation or modification of EPA's discretion within the meaning of this paragraph.
17. Nothing in this Consent Decree shall be construed as an admission of any issue of fact or law or to waive or limit any claim or defense, on any grounds, related to any final action EPA may take with respect to the SIPs or FIPs

identified in paragraphs 3 through 11 of this Consent Decree.

18. Nothing in this Consent Decree shall be construed to confer upon the district court jurisdiction to review any final decision made by EPA pursuant to this Consent Decree. Nothing in this Consent Decree shall be construed to confer upon the district court jurisdiction to review any issues that are within the exclusive jurisdiction of the United States Court of Appeals pursuant to CAA section 307(b)(1) and 505, 42 U.S.C. §§ 7607(b)(1), 7661d. Nothing in this Consent Decree shall be construed to waive any remedies or defenses the Parties may have under CAA section 307(b)(1), 42 U.S.C. § 7607(b)(1).
19. The Parties recognize and acknowledge that the obligations imposed upon EPA under this Consent Decree can only be undertaken using appropriated funds legally available for such purpose. No provision of this Consent Decree shall be interpreted as or constitute a commitment or requirement that EPA obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable provision of law.
20. Any notices required or provided for by this Consent Decree shall be made in writing and sent via e-mail to the following:

For Guardians:

Ashley Wilmes
awilmes@wildearthguardians.org

James Tutchton
jtuthton@wildearthguardians.org

For NPCA:

Reed Zars
rzars@lariat.org

For EDF:

Pamela Campos
pcampos@edf.org

For EPA:

Alan Greenberg
alan.greenberg@usdoj.gov

Lea Anderson
anderson.lea@epa.gov

Jonah Staller
staller.jonah@epa.gov

21. In the event of a dispute among the Parties concerning the interpretation or implementation of any aspect of this Consent Decree, the disputing Party shall provide the other Party with a written notice outlining the nature of the dispute and requesting informal negotiations. If the Parties cannot reach an agreed-upon resolution within ten business days after receipt of the notice, any Party may move the Court to resolve the dispute.
22. No motion or other proceeding seeking to enforce this Consent Decree or for contempt of court shall be properly filed unless the Party seeking to enforce this Consent Decree has followed the procedure set forth in Paragraph 21.
23. The Court shall retain jurisdiction to determine and effectuate compliance with this Consent Decree, to resolve any disputes thereunder, and to consider any requests for costs of litigation (including reasonable attorneys' fees). After EPA's obligations under Paragraphs 3 through 14 have been completed, this consent decree may be terminated. EPA shall notify the Court by motion of the completion of its obligations under Paragraphs 3 through 14, and Plaintiffs shall have 14 days in which to respond to such motion.
24. The Parties agree and acknowledge that before this Consent Decree can be finalized and entered by the Court, EPA must provide notice in the Federal Register and an opportunity for comment pursuant to CAA section 113(g), 42 U.S.C. § 7413(g). EPA will deliver a public notice of this Consent Decree to the Federal Register for publication and public comment within 10 business days after lodging this Consent Decree with the Court. After this Consent Decree has undergone an opportunity for notice and comment, EPA's Administrator and the Attorney General, as appropriate, will promptly consider any such written comments in determining whether to withdraw or withhold consent to this Consent Decree, in accordance with section 113(g) of the Clean Air Act. If the Administrator or the Attorney General elects not to withdraw or withhold consent to this Consent Decree, the Parties will promptly file a motion that requests the Court to enter this Consent Decree. If a motion to enter the Consent Decree is not filed within 90 days after the notice is published in the Federal Register, any party may file dispositive motions in this matter.
25. It is hereby expressly understood and agreed that this Consent Decree was jointly drafted by the Parties and that any and all rules of construction to the effect that ambiguity is construed against the drafting party shall be inapplicable in any dispute concerning the terms, meaning, or interpretation of this Consent Decree.
26. The undersigned representatives of each Party certify that they are fully authorized by the Party they represent to bind that Party to the terms of this Consent Decree.
- SO ORDERED this ____ day of _____, 2011.
- _____
United States District Judge
24. The Parties agree and acknowledge that before this Consent Decree can be finalized and

SO AGREED:

FOR PLAINTIFF WILDEARTH GUARDIANS

s/Ashley D. Wilmes
Dated: June 6, 2011
Ashley D. Wilmes
WildEarth Guardians
827 Maxwell Ave., Suite L
Boulder, CO 80304
(859) 312-4162
awilmes@wildearthguardians.org

FOR PLAINTIFF NATIONAL PARKS CONSERVATION
ASSOCIATION:

s/ Reed Zars
Dated: June 6, 2011
Reed Zars
Attorney at Law
910 Kearney Street
Laramie, WY 82070
307-745-7979
rzars@lariat.org

FOR ENVIRONMENTAL DEFENSE FUND:

s/ Pamela Campos
Dated: June 6, 2011
Pamela Campos
Environmental Defense Fund
2060 Broadway, Suite 300
Boulder, CO 80302
720-205-2366
pcampos@edf.org

FOR DEFENDANT LISA JACKSON:

IGNACIA S. MORENO
Assistant Attorney General
Environment and Natural Resources Division

By: s/Alan D. Greenberg
Dated: June 6, 2011
ALAN D. GREENBERG
Environmental Defense Section
Environment and Natural Resources Division
U.S. Department of Justice
999 18th Street
South Terrace, Suite 370
Denver, CO 80202
(303) 844-1366
alan.greenberg@usdoj.gov

IN THE UNITED STATES DISTRICT COURT FOR THE DISTRICT OF COLORADO

Civil Action No. 10-cv-01218-REB-BNB

WILDEARTH GUARDIANS,

Plaintiff,

v.

LISA JACKSON, in her official capacity as Administrator
of the Environmental Protection Agency,

Defendant.

and to order the relief contained in this
Consent Decree.

2. Venue lies in the District of Colorado.

3. Plaintiff and Defendant shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree. Upon entry, no party shall challenge the terms of this Consent Decree. This Consent Decree constitutes a complete and final resolution of all claims which have been asserted or which could have been asserted in the Complaint.

CONSENT DECREE

WHEREAS, on May 26, 2010, Plaintiff WildEarth Guardians filed its Complaint in this action against Lisa Jackson, in her official capacity as Administrator of the United States Environmental Protection Agency ("EPA");

WHEREAS, Plaintiff alleges that EPA has failed to take action on two State Implementation Plan ("SIP") submissions from the State of Utah with the time frame required by section 110(k)(2) of the Clean Air Act, 42 U.S.C. § 7410(k)(2);

WHEREAS, Plaintiff and Defendant have agreed to a settlement of this case without any admission of any issue of fact or law, which they consider to be a just, fair, adequate and equitable resolution of the claims raised in this action; and

WHEREAS, it is in the interest of the public, the parties and judicial economy to resolve the issues in this action without protracted litigation.

NOW, THEREFORE, it is hereby ORDERED,
ADJUDGED AND DECREED as follows:

1. This Court has subject matter jurisdiction over the claims set forth in the Complaint

4. This Consent Decree shall become effective upon the date of its entry by the Court. If for any reason the Court does not enter this Consent Decree, the obligations set forth in this Decree are null and void.

5. By April 30, 2012, EPA shall sign a notice of proposed action in which it proposes either to approve in whole, approve in part and disapprove in part, or disapprove in whole, the State of Utah's Regional Haze SIP submission that Utah submitted to EPA on September 9, 2008. Within 15 days, EPA shall submit the notice for review and publication to the Office of Federal Register.

6. By October 31, 2012, EPA shall sign a final action in which it either approves in whole, approves in part and disapproves in part, or disapproves in whole, the State of Utah's Regional Haze SIP submission that Utah submitted to EPA on September 9, 2008. Within 15 days, EPA shall submit the notice for review and publication to the Office of Federal Register.

7. By December 1, 2011, EPA shall sign a final action in which it either approves in whole, approves in part and disapproves in part, or

disapproves in whole, the State of Utah's request to re-designate Salt Lake and Utah Counties and Ogden City to attainment for the National Ambient Air Quality Standard ("NAAQS") for particulate matter having an aerodynamic diameter of a nominal 10 micrometers ("PM-10"), along with Utah's maintenance plan for Salt Lake and Utah Counties and Ogden City for the PM-10 NAAQS, that Utah submitted to EPA on September 2, 2005, and which EPA previously proposed to disapprove in whole on December 1, 2009. Within 15 days, EPA shall submit the notice for review and publication to the Office of Federal Register.

8. The parties agree, that if the Court enters this Consent Decree, then the parties will amend their Settlement Agreement in *WildEarth Guardians v. Jackson*, No. 09-cv-02148-REB-MJW (D. Colo.), as set forth in this paragraph: Item 5, R307-401, Renumbering of NSR rules; Item 6, R307-413, Soil venting and aeration; Item 8, Rules reorganization, grouping of smaller materials into a coherent structure; Item 10, Ogden PM10 SIP Clean Air Determination; and Item 11, Utah R307-401-14, Used Oil Fuel Burned for Energy Recovery, shall each have a deadline for signature on proposed action of June 15, 2012, and a deadline for signature on final action of December 14, 2012. If the Settlement Agreement in *WildEarth Guardians v. Jackson*, No. 09-cv-02148-REB-MJW (D. Colo.), is not amended as set forth in this paragraph after the Court enters this Consent Decree, then EPA's deadline for final action on the Utah re-designation request and maintenance plan discussed in Paragraph 7 above, shall be December 1, 2012, and not December 1, 2011.
9. The deadlines in Paragraphs 5, 6 and 7 may be extended for a period of 60 days or less by written stipulation executed by counsel for Plaintiff and Defendant and filed with the Court. Any other extension to the deadlines in Paragraphs 5, 6 and 7 or any other modification to this Consent Decree, may be approved by the Court upon motion made pursuant to the Federal Rules of Civil Procedure by either party to this Consent Decree and upon consideration of any response by the non-moving party and reply by the moving party.
10. EPA's obligation to take any action required in Paragraphs 5, 6 and 7 shall become null and void if the underlying SIP submission is withdrawn by the State of Utah prior to the deadline relating to EPA's action on relevant SIP submission or submissions. EPA shall provide WildEarth Guardians with a copy of any written notice of withdrawal prior to the relevant deadline.
11. EPA agrees to settle Plaintiff's claim for costs and attorneys' fees by paying \$5,973.97 as soon as reasonably practicable after entry of this Consent Decree. This amount shall be paid by FedWire Electronic Funds Transfer to WildEarth Guardians' counsel Robert Ukeiley, P.S.C., pursuant to payment instructions provided by Robert Ukeiley. Plaintiff agrees to provide counsel for Defendant all necessary information for processing the electronic funds transfer within five (5) business days of receipt of the Court's order entering this Consent Decree. Plaintiff agrees to accept payment of \$5,973.97 in full satisfaction of any and all claims for costs and attorneys' fees with respect to this case incurred up until the time of entry of this Consent Decree by the Court. EPA does not concede that Plaintiff will be entitled to fees for any efforts after the time of entry of this Consent Decree, and EPA reserves all defenses with respect to any such efforts and any related fee claim. The fees paid under this Paragraph shall have no precedential value in any future fee claim.
12. The Court shall retain jurisdiction to determine and effectuate compliance with this Consent Decree, to rule upon any motions filed in accordance with Paragraph 9 of this Consent Decree, and to resolve any disputes in accordance with Paragraph 17 of this Consent Decree. Once EPA has taken the action called for in Paragraphs 5,

- 6, 7 and 11 of this Consent Decree, this Decree shall be terminated and the case dismissed with prejudice. The Parties may either jointly notify the Court that the Decree should be terminated and the case dismissed, or EPA may so notify the Court by motion. If EPA notifies the Court by motion, then Plaintiff shall have twenty days in which to respond to such motion.
13. Except as provided herein, nothing in this Consent Decree shall be construed to limit or modify any discretion accorded EPA by the Clean Air Act or by general principles of administrative law in taking the actions which are the subject of this Consent Decree.
14. The parties agree and acknowledge that final approval and entry of this proposed Consent Decree are subject to the requirements of Clean Air Act § 113(g), 42 U.S.C. § 7413(g). That subsection provides that notice of this proposed Decree be given to the public, that the public shall have a reasonable opportunity to make any comments, and that the Administrator or the Attorney General, as appropriate, must consider those comments in deciding whether to consent to this Consent Decree. After this Consent Decree has undergone an opportunity for notice and comment, the Administrator and/or the Attorney General, as appropriate, shall promptly consider any such written comments in determining whether to withdraw or withhold consent to this Consent Decree in accordance with section 113(g) of the CAA. If the federal government elects not to withdraw or withhold consent to this Consent Decree, Defendant or the parties shall promptly file a motion that requests the Court to enter this Consent Decree.
15. Nothing in the terms of this Consent Decree shall be construed to waive any remedies Plaintiff may have under section 307(b)(1) of the Clean Air Act, 42 U.S.C. § 7607(b)(1), with respect to any future challenges to the final rulemaking action called for in Paragraphs 6 and 7.
16. Nothing in this Consent Decree shall be construed to provide this Court with jurisdiction over any challenges by Plaintiff or any other person or entity not a party to this litigation with respect to any future challenges to the final rulemaking action called for in Paragraphs 6 and 7.
17. In the event of a dispute between the parties concerning the interpretation or implementation of any aspect of this Consent Decree, the disputing party shall contact the other party to confer and attempt to reach an agreement on the disputed issue. If the parties cannot reach an agreed-upon resolution, then either party may move the Court to resolve the dispute.
18. It is hereby expressly understood and agreed that this Consent Decree was jointly drafted by Plaintiff and Defendant and that any and all rules of construction to the effect that ambiguity is construed against the drafting party shall be inapplicable in any dispute concerning the terms, meaning, or interpretation of this Consent Decree. This Consent Decree shall be governed and construed under the laws of the United States.
19. The obligations imposed upon EPA under this Consent Decree may only be undertaken using appropriated funds. No provision of this Decree shall be interpreted as or constitute a commitment or requirement that EPA obligate funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341, or any other applicable law or regulation.
20. The undersigned representative of each party certifies that he is fully authorized to consent to the Court's entry of the terms and conditions of this Consent Decree.
21. Any written notices or other written communications between the parties contemplated under this Consent Decree shall be sent to the undersigned counsel at the addresses listed in the signature blocks below unless written notice of a change in counsel and/or address is provided.

Respectfully submitted,

IGNACIA S. MORENO
 Assistant Attorney General
 Dated: 10/28/2010
 s/David A. Carson
 DAVID A. CARSON
 United States Department of Justice Environment
 and Natural Resources
 Division
 999 18th Street
 South Terrace, Suite 370
 Denver, Colorado 80202
 (303) 844-1349
 david.a.carson@usdoj.gov

COUNSEL FOR DEFENDANT

Dated: 10/8/2010
 s/Robert Ukeiley
 ROBERT UKEILEY
 Law Office of Robert Ukeiley
 435R Chestnut Street, Suite 1
 Berea, Kentucky 40403
 (859) 986-5402
 rukeiley@igc.org

COUNSEL FOR PLAINTIFF

Upon consideration of the foregoing, the Court
 hereby finds that this Consent Decree is fair,
 reasonable, consistent with the Clean Air Act and in
 the public interest., and the Court hereby enters the
 Consent Decree.

IT IS SO ORDERED.

Date: _____

 United States District Judge

WILDEARTH GUARDIANS,)
)
 Plaintiff)
)
 v.) CASE NO. 4:09-CV-02453-CW
)
)
 LISA JACKSON, in her official capacity as)
 Administrator of the Environmental Protection Agency)
)
 Defendant)

NOW THEREFORE, it is hereby ORDERED,
ADJUDGED and DECREED that:

1. This Court has subject matter jurisdiction over the claims set forth in the complaint and to order the relief contained in this consent decree. 2:09-cv-02453-CW CONSENT DECREE

2. Venue lies in the Northern District of California.
3. Plaintiff and EPA shall not challenge the terms of this Consent Decree or this Court's jurisdiction to enter and enforce this Consent Decree. Upon entry, no party shall challenge the terms of this Consent Decree. This Consent Decree constitutes a final resolution of all claims raised in the complaint.

4. No later than May 10, 2010, the Administrator shall sign a notice or notices:

(a) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP, for (i) New Mexico and North Dakota to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding contributing significantly to nonattainment in other states for the 1997 NAAQS for 8-hour ozone and PM_{2.5}, and (ii) Colorado to meet the requirement of 42

U.S.C. § 7410(a)(2)(D)(i)(I) regarding contributing significantly to nonattainment in other states for the 1997 NAAQS for 8-hour ozone; and

(b) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP for North Dakota to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding interfering with measures in other states related to prevention of significant deterioration of air quality.

5. No later than November 10, 2010, the Administrator shall sign a notice or notices:

(a) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP for Idaho to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding contributing significantly to nonattainment in other states for the 1997 NAAQS for 8-hour ozone and PM2.5;

(b) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP for (i) Idaho, New Mexico, and North Dakota to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding interfering with maintenance of attainment in other states for the 1997 NAAQS for 8-hour ozone and PM2.5, and (iii) Colorado to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding interfering with maintenance of attainment in other states for the 1997 NAAQS for 8-hour ozone; and

(c) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP for Idaho, New Mexico, and Oklahoma to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(II) regarding interfering with measures in other states related to prevention of significant deterioration of air quality.

6. No later than May 10, 2011, the Administrator shall sign a notice or notices:

(a) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation

of a partial FIP, for (i) California, Oklahoma, and Oregon to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding contributing significantly to nonattainment in other states for the 1997 NAAQS for 8-hour ozone and PM2.5, and (iii) Colorado to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding contributing significantly to nonattainment in other states for the 1997 NAAQS for PM2.5;

(b) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP, for (i) California, Oklahoma, and Oregon to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding interfering with maintenance of attainment in other states for the 1997 NAAQS for 8-hour ozone and PM2.5, and (iii) Colorado to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(I) regarding interfering with maintenance of attainment in other states for the 1997 NAAQS for PM2.5; and

(c) either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP, for California, Colorado, and Oregon to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(II) regarding interfering with measures in other states related to prevention of significant deterioration of air quality.

7. (a) No later than May 10, 2011, the Administrator shall sign a notice or notices either approving a SIP, promulgating a FIP, or approving a SIP in part with promulgation of a partial FIP, for California, Colorado, Idaho, New Mexico, North Dakota, Oklahoma, and Oregon to meet the requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(II) regarding interfering with measures in other states related to protection of visibility;

(b) If any of the States identified in paragraph 7(a) has not submitted an administratively complete proposed SIP to address the visibility requirement of 42 U.S.C. § 7410(a)(2)(D)(i)(II) by May 10, 2010, then by November 10, 2010, the Administrator shall sign a notice or notices proposing for each such State either

promulgation of a FIP, approval of a SIP (if one has been submitted in the interim), or partial promulgation of a FIP and partial approval of a SIP, to address the visibility requirement.

8. Within 15 business days following signature of such action required by paragraphs 4 - 7, EPA shall deliver notice of such action to the Office of the Federal Register for prompt publication. Following such delivery to the Office of the Federal Register, EPA shall not take any step (other than as necessary to correct within 10 business days after submittal any typographical or other errors in form) to delay or otherwise interfere with publication of such notice in the Federal Register.
9. The deadlines in paragraphs 4 through 7 may be extended for a period of 60 days or less by written stipulation executed by counsel for WildEarth Guardians and EPA and filed with the Court. Any other extension to the decree deadlines may be approved by the Court upon motion by any party to this Consent Decree and upon consideration of any response by the non-moving party.
10. Plaintiff alleges that it is the "prevailing party" in this action and that, as such, it is entitled to reasonable attorney's fees and costs pursuant to section 304 of the CAA, 42 U.S.C. § 7604. The parties hereby agree to settle all of Plaintiff's claims for attorney's fees and costs in this action, without further litigation or any final determination regarding entitlement to or reasonableness of attorney's fees and costs, for a total of \$ 22,420.00. Payment shall be made by electronic funds transfer to the account specified by Plaintiff's counsel Robert Ukeiley. Plaintiff agrees to provide counsel for Defendant all necessary information for processing the electronic funds transfer within five (5) business days of receipt of the Court's order entering this Consent Decree. In the event that the payment required by this Paragraph is not made within 90 days of entry of this Order, interest on the unpaid balance shall be paid at the rate established pursuant to

section 107(a) of CERCLA, 42 U.S.C. § 9607(a), commencing on the effective date of this Order and accruing through the date of the payment.

11. Plaintiff agrees that receipt from Defendant of the payment described in Paragraph 10 shall operate as a release of Plaintiff's claims for attorneys' fees and costs in this matter through and including the date of this agreement. The parties agree that Plaintiff reserves the right to seek additional fees and costs incurred subsequent to this agreement arising from a need to enforce or defend against efforts to modify the schedule outlined herein, or for any other unforeseen continuation of this action.
12. By this agreement, Defendant does not waive any right to contest fees claimed by Plaintiff or Plaintiff's counsel, including the hourly rate, in any future litigation, or in any continuation of the present action. Further, this stipulation as to attorney's fees and costs has no precedential value and shall not be used as evidence in any other attorneys' fees litigation.
13. The Court shall retain jurisdiction to determine and effectuate compliance with this Consent Decree. Upon EPA's demonstration that it has satisfied all of the obligations of this Consent Decree it may move to have this decree terminated. Plaintiff shall have twenty days in which to respond to such motion.
14. Except as provided herein, nothing in this Consent Decree shall be construed to limit or modify any discretion accorded EPA by the Clean Air Act or by general principles of administrative law in taking the actions which are the subject of this Consent Decree.
15. The parties agree and acknowledge that final approval and entry of this proposed Consent Decree are subject to the requirements of Clean Air Act § 113(g), 42 U.S.C. § 7413(g). That subsection provides that notice of this proposed Decree be given to the public, that the public shall have a reasonable opportunity to make any comments, and that

the Administrator or the Attorney General, as appropriate, must consider those comments in deciding whether to consent to this Consent Decree.

16. Nothing in the terms of this Consent Decree shall be construed to waive any remedies plaintiff may have under section 307(b)(1) of the Clean Air Act, 42 U.S.C. § 7607(b)(1).
17. In the event of a dispute between the parties concerning the interpretation or implementation of any aspect of this Consent Decree, the disputing party shall contact the other party to confer and attempt to reach an agreement on the disputed issue. If the parties cannot reach an agreed-upon resolution, then either party may move the Court to resolve the dispute.
18. EPA's commitments in this Decree are subject to the availability of appropriated funds. No provision of this Decree shall be interpreted as or constitute a commitment or requirement that EPA obligate funds in contravention of the Anti-Deficiency Act, 31 U.S.C. § 1341 or any other applicable law or regulation.
19. The undersigned representatives of each party certify that he is fully authorized to consent to the Court's entry of the terms and conditions of this Consent Decree.

Counsel for Plaintiff
 IGNACIA S. MORENO
 Assistant Attorney General
 Dated: February 18, 2010
 /S/ Norman L. Rave, Jr.
 NORMAN L. RAVE, JR.
 Trial Attorney
 United States Department of Justice
 Environment and Natural Resources Division
 P.O. Box 23986
 Washington, D.C. 20026-3986
 Tel: (202) 616-7568
 Fax: (202) 514-8865

Counsel for Defendant

IT IS SO ORDERED.

2/23/10

Dated: _____

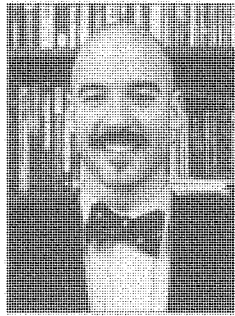
 The Honorable Claudia Wilken
 United States District Judge

Dated: February 18, 2010
 /S/ James J. Tutchton (by permission)
 James J. Tutchton (CA Bar No. 150908)
 WildEarth Guardians
 1536 Wynkoop St., Suite 301
 Denver, CO 80202
 Telephone: (303) 573-4898

Of Counsel:

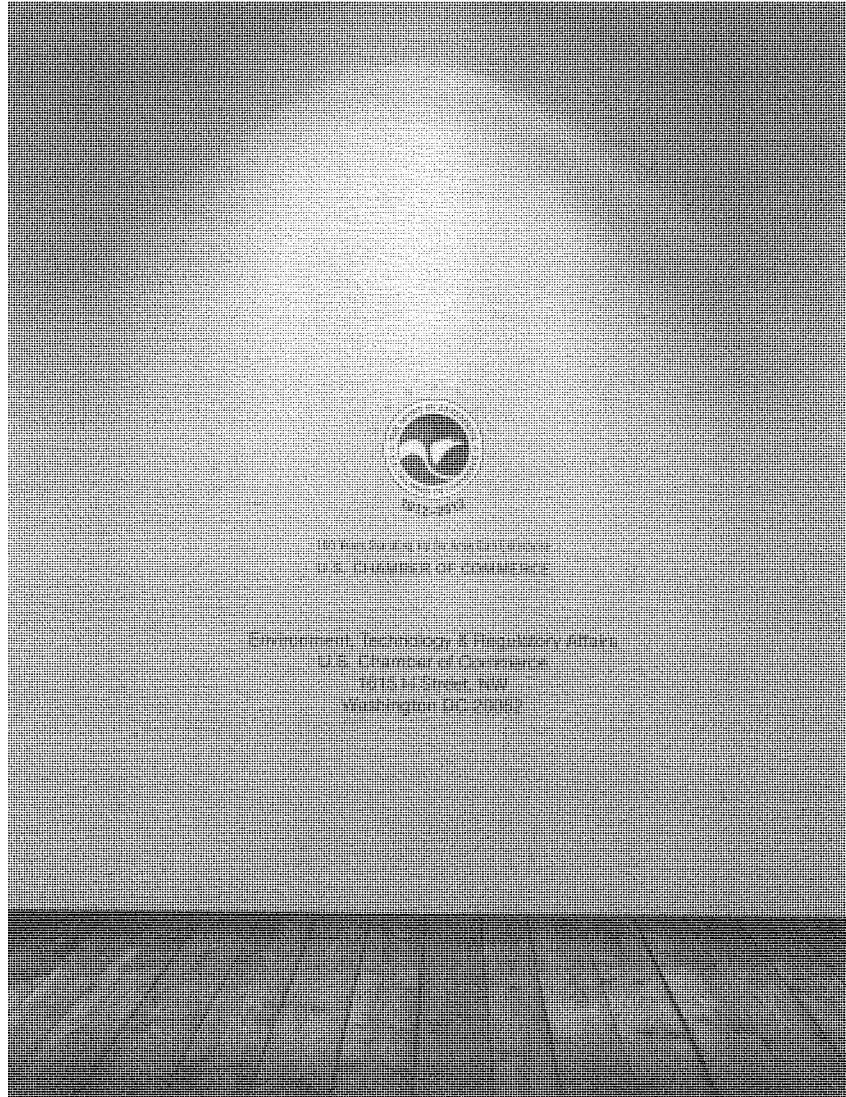
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About the Author



William Yeatman

William Yeatman is assistant director of the Center for Energy and Environment at the Competitive Enterprise Institute (CEI), a free-market think tank in Washington, D.C. His energy commentary has appeared in newspapers and magazines across the country, and he is a frequent guest on television and radio. He has testified before the U.S. House of Representatives and also state legislatures. Prior to joining CEI, Yeatman was a Peace Corps volunteer in the Kyrgyz Republic, where he taught entrepreneurship and small business management to rural women. Before that, he ran a homeless shelter in Denver, Colorado. Yeatman holds a master's in international administration from the Denver Graduate School of International Studies and a bachelor's in environmental sciences from the University of Virginia.



BILL FLORES
MEMBER OF CONGRESS
17TH DISTRICT, TEXAS

REPUBLICAN STUDY COMMITTEE
CHAIRMAN

1030 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
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Congress of the United States
House of Representatives
Washington, DC 20515-4317

May 29, 2015

COMMITTEE ON
ENERGY AND COMMERCE
SUBCOMMITTEE ON
ENERGY AND POWER
SUBCOMMITTEE ON
ENVIRONMENT AND THE ECONOMY
SUBCOMMITTEE ON
OVERSIGHT AND INVESTIGATIONS

The Honorable Gina McCarthy
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Dear Administrator McCarthy,

I am concerned that efforts by the Environmental Protection Agency (EPA) to override state action under the Regional Haze Program will place undue and unnecessary burden on Texas.

Though air quality in the state and across the country continues to improve, EPA is now imposing on Texas expensive measures that will increase energy costs to meet goals that Texas falls short of only in flawed models and that, in reality, the state has already achieved.

Texas has long worked with other states to meet goals under the Regional Haze Program, which focuses solely on improving visibility at "Class 1" national parks and wilderness areas and is not based on public health. In 2009, Texas submitted a state-drafted plan under the Regional Haze Program that incorporated emission reductions to meet visibility goals set by Oklahoma for that state's Wichita Mountains area. EPA has traditionally given states flexibility to determine "reasonable progress" towards these goals, and both Texas and Oklahoma agreed that the Texas plan met this goal for Wichita Mountains. Nevertheless, on December 16, 2014, EPA decided to rewrite Oklahoma's reasonable progress goal for the Wichita Mountains and proposed a federal plan mandating additional reductions from Texas to meet EPA's new goal, while proposing no additional reductions for Oklahoma.

As with the rest of the country, the air in Texas is the cleanest it has been in 30 years, and visibility at Class 1 areas in and around the state will continue to improve even without EPA's federal plan. Nevertheless, EPA is proposing to require that Texas power plants install multimillion-dollar controls to meet visibility goals *that have already been achieved*. Indeed, 2013 data from EPA's *own monitors* indicates that visibility at the Wichita Mountains, as well as at two other Class 1 areas in Texas, is currently at levels better than what EPA's plan asserts is necessary by 2018.

Simply put, the state plan that Texas submitted in 2009 *was working* before EPA threw it out. EPA fails to acknowledge this real progress towards its plan's goals because the Agency instead clings to modeling that inaccurately projects future visibility effects. EPA's plan attempts to model the impact of emissions from individual power plants on visibility at Class 1 areas nearly 400 kilometers away. Yet, the National Academy of Science long ago warned EPA that efforts to tie individual sources to visibility changes would be "doomed to failure." Even the company

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3000 BRIARCREST DRIVE, SUITE 406
BRYAN, TX 77802
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14205 BURNET ROAD, SUITE 230
AUSTIN, TX 78728
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The Honorable Gina McCarthy
Page 2

that EPA hired to conduct the federal plan's modeling reports that the results are "suspect" and notes that "care should be taken in the interpretation of the visibility projections at these Class I areas." In fact, that company concluded that the modeling overpredicts visibility impacts by 300% when used as EPA directs in the federal plan. EPA ignored repeated warnings, even from its own hired experts, not to pursue the federal plan's regulatory approach, and it is Texas businesses and families that are left with the consequences.

Based on these flawed modeling results, EPA takes the unprecedented step of targeting specific Texas power plants to require the installation of expensive controls to achieve imperceptibly small modeled visibility improvements. It is worth noting that, in prior regional haze actions involving visibility improvements in other states that were three times larger than those EPA seeks from Texas, EPA classified those improvements as "relatively small" and an unreasonable basis for regulation. Yet in Texas, EPA is proposing to require consumers spend over \$2 billion in higher energy costs to, assuming EPA's models are correct, increase an already 28.4 mile view by only the length of seven football fields—negligible, non-health benefits at a cost of nearly \$2.8 million *per yard*. By EPA's own metric, the controls required in the plan would result in modeled visibility improvements that, if realized, could not even be seen by the human eye.

Because EPA's federal plan does not appear to make economic or scientific sense, I request that you provide answers to the following questions:

1. Do the averaged 2009 to 2013 results from EPA's IMPROVE monitoring system indicate that visibility at Wichita Mountains currently exceeds the federal plan's 2018 goals?
2. The modeling in EPA's federal plan does not align with real-world data from EPA's IMPROVE monitoring system. What steps is EPA taking to improve that modeling before finalizing the plan?
3. EPA has been told that the federal plan's modeling likely overpredicts visibility impacts by 300%. Why, then, did EPA not conduct a full performance evaluation of the model before relying on the results in the federal plan?
4. Why is EPA mandating that Texas install expensive controls to achieve modeled visibility improvements that the Agency has told other states are "relatively small" and an "unreasonable" basis for regulation?
5. Does EPA believe that it is reasonable to impose \$2 billion of new energy costs on Texas in order to improve modeled visibility by less than half a mile, at a cost of about \$2.8 million per yard?
6. Could the human eye detect the visibility improvements resulting from the controls sought in EPA's federal plan?

In light of its serious and immediate impact on Texas, I encourage EPA to reconsider and withdraw its federal plan. If the Agency nevertheless decides to proceed, these questions should be promptly addressed so that the public may thoroughly analyze EPA's responses before the

The Honorable Gina McCarthy
Page 3

federal plan is finalized. Therefore, I ask that you respond to these questions no later than June 22, 2015. Please direct any questions on this matter to Eric Gustafson in my office at (202) 225-6105.

With great respect,

A handwritten signature in black ink, appearing to read "Bill Flores", with a stylized flourish at the end.

Bill Flores
Member of Congress



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202 - 2733

Office of the Regional Administrator

July 13, 2015

The Honorable Bill Flores
House of Representatives
Washington, D.C. 20515

Dear Congressman Flores:

Thank you for your letter of May 29, 2015, to Administrator McCarthy regarding the U.S. Environmental Protection Agency's actions with respect to the Texas and Oklahoma regional haze plans. Your letter was forwarded to Region 6 for reply because Texas falls within its jurisdiction.

The proposal was published December 16, 2014, 79 FR 74818, and the comment period ended on April 20, 2015. You raise a number of concerns regarding the federal regional haze plans, and you request that we specifically answer six questions by June 22, 2015. Unfortunately, due to constraints under administrative law, I can only respond to your concerns and questions as part of the formal rulemaking process which is scheduled to be completed by December 9, 2015.

Your letter arrived after the end of the comment period on the Texas and Oklahoma proposed rulemaking. However, I want to assure you that we will consider it as part of the comments on the proposal, and have included the letter in the docket. This means that we are required to carefully evaluate your comments, and respond to them in our final rulemaking action published in the Federal Register.

After careful evaluation of all the comments received, we will make appropriate adjustments to our proposal. Because of the legal constraints on agency rulemaking, we are unable to respond to your questions at this time. These legal restrictions are in place to insure that we consider all the comments we receive before making any final decisions. Once we finalize our proposal, I will provide you with a copy.

If you have any questions, please contact me at (214) 665-2100, or your staff may contact Mr. Austin Vela, Congressional Liaison, at (214) 665-9792.

Sincerely,


Ron Curry
Regional Administrator



American Electric Power
 1 Riverside Plaza
 Columbus, OH 43215-2373
 AEP.com

April 20, 2015

Via Electronic Submission & First Class Mail

Mr. Guy Donaldson, Chief
 Air Planning Section (6PD-L)
 Attn: Docket ID No.: EPA-R06-OAR-2014-0754
 Environmental Protection Agency
 1445 Ross Avenue, Suite 1200
 Dallas, Texas 75202-2733
R6_TXOKRegionalHaze@epa.gov

Re: **Comments of American Electric Power Company, Inc. (AEP) on behalf of Southwestern Electric Power Company (SWEPCO) and Public Service Company of Oklahoma (PSO) to Environmental Protection Agency's (EPA) Approval and Promulgation of Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze And Interstate Transport of Pollution Affecting Visibility**

Dear Mr. Donaldson:

American Electric Power Company, Inc. (AEP) submits these comments on behalf of SWEPCO and PSO on the proposed Approval and Promulgation of Implementation Plans for the states of Texas and Oklahoma in Docket No. EPA-R06-OAR-2014-0754 as published in 79 *Fed. Reg.* 74,818 (December 16, 2014). In this proposed rule, EPA proposes to partially approve and partially disapprove a revision to the Texas State Implementation Plan (Texas SIP), received on March 31, 2009, that addresses regional haze for the first planning period from 2008 through 2018. EPA states that it is disapproving the Texas SIP provisions related to reasonable progress, the long-term strategy, and the calculation of natural visibility conditions. EPA also proposes to partially disapprove the reasonable progress goals in the Oklahoma State Implementation Plan (Oklahoma SIP) submitted in February 19, 2010, that address regional haze in the Wichita Mountains Class I area for the first planning period. Simultaneously, EPA is proposing a Federal Implementation Plan (FIP) for Texas and Oklahoma.¹

¹ 70 *Fed. Reg.* 74,818 (December 16, 2014)

AEP ranks among the nation's largest generators of electricity, owning nearly 38,000 megawatts of generating capacity in the U.S., including generating capacity in Texas and Oklahoma. AEP also owns the nation's largest electricity transmission system, a nearly 39,000-mile network covering a 197,000 square mile service territory supplying power to over 5.2 million customers.

In Texas, SWEPCO, a unit of AEP, serves more than 524,000 customers in Louisiana, Texas and Arkansas. In Oklahoma, PSO, also a unit of AEP, serves more than 540,000 customers in eastern and southwestern Oklahoma.

AEP supports and incorporates by reference the industry member association comments of the Edison Electric Institute (EEI), Utility Air Resources Group (UARG), Association of Electric Companies of Texas (AECT) and Gulf Coast Lignite Coalition (GCLC) all of which AEP is a member.

AEP supports EPA's approval of the TCEQ's BART rules. However, for the reasons stated in more detail in the comments incorporated by reference above, AEP urges and requests that EPA withdraw its proposed disapproval of the Texas and Oklahoma SIP provisions and approve those SIP provisions in full. In turn, EPA must withdraw its proposed FIP which purportedly addresses the disapproved provisions.

Texas and Oklahoma submitted provisions that satisfied the requirements of the Clean Air Act, the regional haze regulations and the EPA's guidance for tracking reasonable progress. The requirements and guidance provide a process and framework that directs states to develop a plan that demonstrates reasonable progress toward the national goal. As noted in these requirements, EPA's role is to defer to the states in the plan development and goal setting.

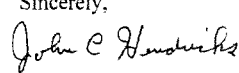
In contrast, in this proposal, EPA has provided new guidance with its "interpretations" that fails to demonstrate that the Texas and Oklahoma SIPs do not represent reasonable progress; especially given the length of time to achieve the goal by 2064. EPA also fails to take into consideration recent information, the TCEQ's 2014 Five-Year Regional Haze SIP Revision or the effects of early action or emission reduction accomplished or to be accomplished by other EPA programs before imposing additional requirements beyond the state submitted SIPs. Considering that the visibility improvements of these programs have not yet been quantified, and the gradual progress anticipated in establishing such a long term goal, EPA should be patient and not take such aggressive action in overriding reasonable state SIPs and imposing additional controls. As detailed in the comments of the member associations, EPA's actions are not timely and will not be realized during the progress planning period and are therefore unlawful.

EPA's proposal departs from past practices and precedent and is outside the scope of the requirements of the CAA, regional haze rule, and reasonable progress guidance. EPA's actions

are troubling, as well as arbitrary and capricious, and an abuse of discretion. For these reasons, EPA should withdraw its proposed disapproval and FIP and fully approve the Texas and Oklahoma regional haze SIP provisions.

Should you have any questions concerning these comments, please contact Bruce Moore at bwmoore@aep.com.

Sincerely,

 (for John McManus)

John McManus
V.P. Environmental Services

cc: John Hendricks, AEP Services
Bruce Moore, AEP Services
Janet Henry, AEP Services
Brian Bond, SWEPCO
John Harper, PSO



GOVERNOR GREG ABBOTT

April 20, 2015

Mr. Guy Donaldson
Chief, Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Docket No. EPA-R06-OAR-2014-0754

Dear Mr. Donaldson:

Big Bend and the Guadalupe Mountains are two of the most beautiful places on earth. For centuries, Texans and non-Texans alike have flocked to both areas to enjoy their majestic vistas. And as the Governor of Texas, I could not be prouder that our State is home to these national treasures.

But EPA's proposed decision to partially disapprove Texas's state implementation plan ("SIP") and to promulgate a federal implementation plan ("FIP") would do nothing to improve visibility in Big Bend or the Guadalupe Mountains. Moreover, EPA's proposed actions would impose more than \$2 billion in compliance costs on Texans. Whatever EPA's motivation, the results of the "regional haze" rule are absurd, arbitrary, capricious, and contrary to law.

1. This dispute boils down to a fight over so-called "deciviews"—or, more accurately, a fight over *fractions* of a "deciview." "A deciview is a haze index derived from calculated light extinction, such that uniform changes in haziness correspond to uniform incremental changes in perception across the entire range of conditions, from pristine to highly impaired." 40 C.F.R. § 51.301. The human eye only can detect a change in haziness of 1.0 or more deciviews. *E.g.*, 79 Fed. Reg. 58,302, 58,303. EPA nonetheless proposed to FIP the State of Texas because it wanted to reduce haziness at Big Bend by merely *0.12 deciviews* and at the Guadalupe Mountains by merely *0.15 deciviews*—reductions that fall dramatically below the threshold of visibility. 79 Fed. Reg. 74,818, 74,887 tbl. 44.

On its own terms, EPA's actions are unlawful. The Clean Air Act gives EPA authority only over the "impairment of visibility." 42 U.S.C. § 7491(a)(1). And "visibility," of course, extends only

Mr. Guy Donaldson
 Docket No. EPA-R06-OAR-2014-0754
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to the things that humans can see with their naked eyes. *E.g.*, WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 2557 (1981) ("visible" means "capable of being seen"; "visibility" means "the degree or extent to which something is visible . . . [by] the observer's eye unaided by special optical devices"). The statute obviously does not give EPA authority to regulate *invisible* haze, which falls far below the 1.0-deciview threshold.

Moreover, EPA's premises are wrong. Because EPA took almost six years to act on Texas's proposed SIP, EPA did not have the up-to-date facts when it decided that the State was not doing enough to regulate visibility. And if EPA had bothered to look, it would have discovered that the haziness conditions in Big Bend and the Guadalupe Mountains are much better today than Texas projected way back in 2009. And those conditions will continue to improve even without EPA's costly-but-ineffectual regulations.

Indeed, cost alone renders the FIP unlawful. EPA has a statutory obligation to "take[] into consideration the costs of compliance." 42 U.S.C. § 7491(g)(1). Yet EPA's FIP makes no mention of how much its additional controls will cost. EPA staff have confirmed that those controls will cost at least \$2 *billion*—all for reductions in haziness that are 1/8th the magnitude that would be visible to the naked eye. EPA cannot comply with Section 7491(g)(1) by asking its staff to make informal, back-of-the-envelope guesstimates. Nor can it comply with the statute by dictating such unreasonably large expenditures for invisibly small benefits.

2. Second, EPA's actions are irrationally and arbitrarily discriminatory against the State of Texas. *Cf. Nw. Austin Mun. Util. Dist. No. One v. Holder*, 557 U.S. 193, 203 (2009) (emphasizing "our historic tradition that all the States enjoy equal sovereignty" (internal quotation marks omitted)). It appears that EPA has devised one set of rules for States it likes and another set for States it dislikes.

For example, in 2011, EPA approved California's "regional haze" SIP. *See* 76 Fed. Reg. 34,608 (2011). In doing so, EPA gave the State of California until the year 2307 to eliminate "regional haze" at Desolation Wilderness and Mokelumne Wilderness, until the year 2106 to eliminate "regional haze" at Joshua Tree National Park, and until the year 2096 to eliminate "regional haze" at Sequoia National Park. Apparently, for a State like California, EPA thinks that up to 300 years constitutes "reasonable progress." 42 U.S.C. § 7491.

But EPA took a dramatically disparate approach to Texas's SIP. After it gave California up to 300 years to eliminate "regional haze," EPA faulted Texas's plan to eliminate regional haze *even faster*. In particular, Texas proposed to eliminate "regional haze" in the Guadalupe Mountains by 2081 and in Big Bend by 2155. While that rate of haze-elimination clearly would have been "reasonable" in California, EPA determined that it was "not reasonable" in Texas. 79 Fed. Reg. at 74,843.

Mr. Guy Donaldson
 Docket No. EPA-R06-OAR-2014-0754
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EPA's capricious discrimination violates the "fundamental norm of administrative procedure [that] requires an agency to treat like cases alike. If the agency makes an exception in one case, then it must either make an exception in a similar case or point to a relevant distinction between the two cases." *Westar Energy, Inc. v. FERC*, 473 F.3d 1239, 1241 (D.C. Cir. 2007). EPA has done nothing to explain why one set of rules applies to California while another, stricter set applies to Texas. This is the definition of arbitrary.

The only self-evident explanation for EPA's discrimination is that California has fewer coal-fired power plants than does Texas. According to the latest data I have seen, Texas has 40 coal-fired electric generating units ("EGUs") while California only has 10. But Part C of the Clean Air Act does not give EPA the power to conduct a witch hunt against coal; it only allows EPA to "protect visibility." And Texas's SIP would reduce the same amount of visible haze as EPA's FIP while costing \$2 billion less, and it would reduce haze faster than California's plan would. EPA cannot premise its FIP authority on its dislike of coal and/or its desire to play favorites between States.

3. Third, EPA's FIP violates the Commerce Clause, U.S. Const. art. I, § 8, cl. 3. The Commerce Clause gives Congress power "[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes." *Ibid*. While modern court decisions have expanded that text far beyond its plain or original meanings, the Clause still imposes meaningful limits on what Congress and administrative agencies can do. As the Fifth Circuit has held:

Neither the plain language of the Commerce Clause, nor judicial decisions construing it, suggest that . . . Congress may regulate activity (here, Cave Species takes) solely because non-regulated conduct (here, commercial development) by the actor engaged in the regulated activity will have some connection to interstate commerce. . . . To accept [such an] analysis would allow application of otherwise unconstitutional statutes to commercial actors, but not to non-commercial actors. There would be no limit to Congress' authority to regulate intrastate activities, so long as those subjected to the regulation were entities which had an otherwise substantial connection to interstate commerce.

GDF Realty Inv., Ltd. v. Norton, 326 F.3d 622, 634 (5th Cir. 2003).

Yet that is exactly what EPA has interpreted the Clean Air Act to allow. EPA concedes that the majority of "regional haze" in Big Bend and the Guadalupe Mountains comes from non-regulated conduct—namely, emissions from Mexico and from natural sources (such as dust storms and fires). *See* 79 Fed. Reg. at 74,844 ("Approximately half of the 2002 visibility impairment at Big Bend is due to Mexico and other international sources."); *id.* at 74,885 ("We agree that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method."). EPA cannot then turn around and regulate "regional haze" on the theory that

Mr. Guy Donaldson
 Docket No. EPA-R06-OAR-2014-0754
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regulated conduct—like carbon emissions from coal-fired power plants—will have some effect on interstate commerce.

4. Fourth, EPA’s “regional haze” rule suffers from a non-delegation problem. The Constitution vests “[a]ll legislative Powers herein granted . . . in a Congress of the United States.” U.S. Const. art. I, § 1. If Congress wants to delegate its power to an administrative agency, then Congress must “lay down by legislative act an intelligible principle to which the person or body authorized to [act] is directed to conform.” *J.W. Hampton, Jr., & Co. v. United States*, 276 U.S. 394, 409 (1928). Put differently, Congress cannot enact “a statute creating the Goodness and Niceness Commission and giv[e] it power ‘to promulgate rules for the promotion of goodness and niceness in all areas within the power of Congress under the Constitution.’” Gary Lawson, *The Rise and Rise of the Administrative State*, 107 HARV. L. REV. 1231, 1239 (1994). And where Congress transgresses that line, the agency cannot “cure [the] unlawful delegation of legislative power by adopting in its discretion a limiting construction of the statute.” *Whitman v. Am. Trucking Assns.*, 531 U.S. 457, 472 (2001).

EPA has crowned itself the proverbial Goodness and Niceness Commission. In the Clean Air Act, Congress “declare[d] as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in” places like Big Bend and the Guadalupe Mountains. 42 U.S.C. § 7491(a)(1). That is a vacuous delegation, and EPA has exacerbated it by exercising standardless discretion to approve some SIPs and disapprove others based on illegitimate criteria, inaccurate science, and faulty methods.

5. Finally, EPA has commandeered the States in violation of the Fifth Amendment. “[T]he question whether the Constitution should permit Congress to employ state governments as regulatory agencies was a topic of lively debate among the Framers”—and the Framers emphatically rejected the idea. *New York v. United States*, 505 U.S. 144, 163 (1992). Thus, in *New York*, the Court invalidated a statute that purported to give the States “latitude . . . to implement Congress’ plan” for disposing of nuclear waste. *Id.* at 176. In particular, the statute at issue gave the States a “choice” to either take title to the waste or to enact a series of state regulations. But the Court held that was no “choice” at all because “[n]o matter which path the State chooses, it must follow the direction of Congress.” *Id.* at 177; *see also, e.g., NFIB v. Sebelius*, 132 S. Ct. 2566, 2601-05 (2012); *Printz v. United States*, 521 U.S. 898, 926 (1997).

So too here. EPA has purported to offer the State a “choice” between two unpalatable and federally controlled outcomes. First, the State can submit a SIP that EPA will scrutinize like a teacher grading a pupil’s exam answers, approving some and disapproving others. By turning the SIP-FIP process into a paper-grading exercise, EPA has effectively turned the States into subordinate administrative agencies—in direct contravention of the Framers’ constitutional design. *See New York*, 505 U.S. at 163. Second, the State can forgo a SIP and face draconian penalties—including the loss of highway funds, loss of support for air pollution planning and control programs, and so-called “offset penalties.” *See* 42 U.S.C. § 7509. Moreover, if the State

Mr. Guy Donaldson
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chooses to forgo the SIP process, the statute (and EPA's implementation of it) blurs the accountability for clean-air regulations by making it appear that the State is somehow responsible for not staving off EPA's draconian response. *See Printz*, 521 U.S. at 929-30 (Tenth Amendment forbids statutory schemes that shift costs and perceived responsibilities to the States). That is precisely the sort of coercion that the Tenth Amendment's anti-commandeering principle forbids. *See NFIB*, 132 S. Ct. at 2601-05.

For all of these reasons, in addition to those submitted by the Texas Commission on Environmental Quality, EPA's proposed action is unlawful.

Sincerely,



Greg Abbott
Governor



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April 20, 2015

Via Electronic Submission & First-Class Mail

Mr. Guy Donaldson, Chief
 Air Planning Section (6PD-L)
 Attn Docket ID No.: EPA-R06-OAR-2014-0754
 Environmental Protection Agency
 1445 Ross Avenue, Suite 1200
 Dallas, Texas 75202-2733
R6_TXOKRegionalHaze@epa.gov

Re: Approval and Promulgation of Implementation Plans; Texas and Oklahoma;
 Regional Haze State Implementation Plans; Interstate Transport State
 Implementation Plan to Address Pollution Affecting Visibility and Regional
 Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of
 Pollution Affecting Visibility; Proposed Rule, 79 Fed. Reg. 74,818 (Dec. 16,
 2014); Docket ID No. EPA-R06-OAR-2014-0754
Comments of the Gulf Coast Lignite Coalition

Dear Mr. Donaldson,

The Gulf Coast Lignite Coalition ("GCLC")¹ appreciates the opportunity to submit comments on the U.S. Environmental Protection Agency's ("EPA") proposed rule: Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility (hereinafter, the "Proposed FIP" or the "Rule Proposal").² GCLC members have a proven commitment to reducing air emissions and ensuring cleaner air, but GCLC must oppose EPA's Proposed FIP.

Texas' regional haze state implementation plan ("SIP") submission meets all statutory and regulatory criteria. Texas has fully analyzed and implemented all relevant criteria, worked cooperatively with neighboring states, including Oklahoma, and has exercised its statutorily provided reasonable discretion to establish criteria to implement Clean Air Act ("CAA") visibility protection provisions. EPA's proposed disapproval of key components of Texas' SIP, and its proposal of a federal implementation plan ("FIP") – which includes source-specific sulfur dioxide ("SO₂") emissions limits for fifteen of Texas' electric generating units ("EGUs" or

¹ GCLC is a coalition of entities in the coal, lignite, and electric power industry with power plants and mines in Texas, Louisiana, and Mississippi.

² 79 Fed. Reg. 74818 (Dec. 16, 2014). On January 23, 2015, EPA published in the *Federal Register* an extension of the comment period on the Rule Proposal to April 20, 2015. Accordingly, this comment is timely filed.

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units”) – is without basis, is without prior precedent, and unfairly targets and burdens Texas sources. The Proposed FIP is in direct contravention of the CAA’s substantive requirements and legal principles that provide primacy to the states to implement the substantive components of the Act. EPA has acted arbitrarily and capriciously, abused its discretion, acted otherwise not in accordance with the law, and has proposed a rule that is beyond its authority granted in the CAA. EPA must withdraw its Proposed FIP and allow Texas to continue to implement its SIP, which it has been doing for over the past five years with proven success in improving visibility.

I. EPA may not supplant Texas’ SIP with what EPA believes is a *more* reasonable FIP.

Texas’ SIP submission meets all statutory and regulatory regional haze requirements. EPA’s analysis of Texas’ submission is based on an inappropriate and unsupported interpretation of the CAA and associated regulations that ignores state primacy and flexibility provided to the states in the CAA and in the regional haze program in particular.

Congress delegated to the states the primary responsibility of air pollution control in the CAA.³ When a SIP meets the basic requirements of the CAA, EPA is required to approve the SIP submission.⁴ Section 169A of the CAA specifically places the burden of developing SIPs and leaves determining whether “reasonable progress” has been achieved to the states. For example, regarding the four-factor analysis that is central to a state establishing reasonable progress, EPA itself has recognized that “states have considerable flexibility in how they take these factors into consideration, as noted in EPA’s *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program*.”⁵ EPA has further noted in the recent regional haze SIP rulemaking for Nebraska that regarding the visibility benefit, best available retrofit technology (“BART”), and reasonable progress determinations of the state in its SIP, “[a]s long as this evaluation is done adequately and the states provide a reasoned basis for their decisions, EPA will defer to the state.”⁶ EPA regional haze regulations reinforce this deference to state authority, including (as explained by EPA when issuing those regulations) that “[t]he final [regional haze] rule provides States flexibility in determining the amount of progress that is ‘reasonable’ in light of the statutory factors, and also provides flexibility to determine the best mix of strategies to meet the reasonable progress goal they select.”⁷

It is the clear intent of the CAA to provide states flexibility, which has long been recognized by EPA. This is apparently completely forgotten by EPA in this Proposed FIP. Reviewing EPA’s

³ See 42 USC § 7401(a)(3), which states that “Congress finds... that air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments...” (emphasis added).

⁴ 42 USC § 7410(k)(3), which states that “the Administrator shall approve [a SIP] submittal as a whole if it meets all of the applicable requirements of” the CAA.

⁵ See Approval and Promulgation of Implementation Plans; State of Idaho; Regional Haze State Implementation Plan, Proposed Rule, 77 Fed. Reg. 30248, 30251 (May 22, 2012).

⁶ See Approval, Disapproval and Promulgation of Implementation Plans; State of Nebraska; Regional Haze State Implementation Plan; Federal Implementation Plan for Best Available Retrofit Technology Determination, Final Rule, 77 Fed. Reg. 40150, 40156 (July 6, 2012) (“Nebraska SIP Final Rule”).

⁷ Regional Haze Regulations, Final Rule, 64 Fed. Reg. 35714, 35736 (July 1, 1999).

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rule preamble and its Technical Support Documents (“TSD”), including its Texas Regional Haze State Implementation Plan (“TX TSD”),⁸ Oklahoma and Texas Regional Haze Federal Implementation Plans TSD (“FIP TSD”),⁹ and other supporting documents, it is immediately apparent that EPA’s decision to disapprove Texas’ SIP is not because Texas’ SIP has not demonstrated reasonable progress, but rather, it is because EPA believes its FIP will achieve *more* reasonable progress than Texas.¹⁰

EPA’s approach in this rulemaking, to supplant Texas’ SIP with one that it believes is *more* reasonable, is a direct affront to the cooperative federalism central to the CAA, undermines the purpose behind the lead role that states take in the actual implementation of CAA requirements, and conflicts with federal court precedent. As stated by the 8th Circuit Court of Appeals, “the CAA requires only that a state establish reasonable progress, not the most reasonable progress.”¹¹ EPA’s critiques of the Texas reasonable progress analysis are limited to questions of the reasoned judgment of the state, and EPA attempts to apply standards that are simply not supported by the CAA or EPA’s implementing regulations. Therefore, EPA should recognize Texas’ primacy, withdraw its FIP, and approve Texas’ SIP submission.

II. EPA is unlawfully attempting to double-burden sources already complying with BART requirements and attempts to apply beyond-BART requirements to sources that are explicitly exempted from source-specific BART requirements.

In the context of BART, there are two types of EGUs in Texas: 1) those EGUs that currently comply with BART requirements and are fully controlled under the BART provisions through compliance with the Cross-State Air Pollution Rule (“CSAPR”), and previously the Clean Air Interstate Rule (“CAIR”); and 2) those EGUs that are excluded from BART criteria due to the specific age exclusions (or other exclusions) found in the CAA.

EPA has attempted a regulatory end-around in this FIP proposal by attempting to impose overly burdensome beyond-BART requirements via the reasonable progress goal (“RPG”) and long-term strategy (“LTS”) provisions of the CAA to units that have either already achieved BART compliance through compliance with CAIR and then CSAPR and/or are statutorily excluded from BART requirements.

⁸ U.S. EPA, Technical Support Document for the Texas Regional Haze State Implementation Plan (Nov. 2014) (“TX TSD”).

⁹ U.S. EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (Nov. 2014) (“FIP TSD”).

¹⁰ Once example of EPA’s approach can be found in its TX TSD, in which EPA stated:

“We believe that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions. In other words, the TCEQ could have recognized that implementation of reasonable controls under the Regional Haze Rule would likely not be in addition to anticipated reductions due to CAIR predicted by IPM, but would replace or complement any controls predicted by IPM.” TX TSD at 22. (emphasis added).

¹¹ See *North Dakota v. EPA*, 730 F.3d 750, 768 (8th Cir. 2013).

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Texas' EGUs are currently subject to CSAPR, which EPA has already found to be "better-than-BART."¹² Since these units comply with, and actually exceed, BART limitations, the CAA does not contemplate or require that states impose additional controls on these units as they have already exceeded relevant statutory requirements.¹³ This is not just the position of GCLC, but is EPA's own stated position. As stated in the Reasonable Progress Guidance, "it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG-related requirements for source review in the first RPG planning period. Hence, [a State] may conclude that no additional emissions controls are necessary for these sources in the first planning period."¹⁴ Indeed, we have found no instance where EPA has imposed a FIP for the first planning period requiring additional reasonable progress controls on EGUs that relied on implementation of CAIR or CSAPR to satisfy BART.¹⁵ Therefore, by EPA's own admission and prior regional haze SIP approvals, EPA has already pre-emptively found that Texas' SIP submission regarding BART-subject EGUs is sufficient for the first planning period. Therefore, EPA is without basis to require additional controls on those units already fully meeting and exceeding BART requirements via CSAPR compliance.

Regarding non-BART units, Congress, acknowledging the specified and burdensome nature of BART requirements, provided EPA the authority to impose those source-specific limitations in only limited instances. Specifically, BART could only be applied to those units that were "in existence on August 7, 1977, but which ha[d] not been in operation for more than fifteen years as of such date."¹⁶ By providing this limitation, Congress was ensuring that unit-specific BART limitations could only be applied to those selected units. Despite this limitation, EPA is proposing a rule that imposes beyond-BART limitations, through source-specific SO₂ emissions limits, on specifically exempted EGUs in direct contravention of the CAA.

¹² Regional Haze: Revisions to Provisions Governing Alternatives to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans, Final Rule, 77 Fed. Reg. 33,642, 33,648 (June 7, 2012). GCLC supports EPA's finding that compliance with CSAPR satisfies the BART requirements but also strongly believes that complying with CAIR adequately satisfied BART, as well. Given still some lingering uncertainties regarding CSAPR, due to legal challenges, if in a future legal action or by EPA's own volition, CSAPR's application is delayed, remanded, or vacated nationally or within Texas, EPA must recognize that compliance with CAIR – or whichever avenue the Court chooses to impose following that decision – automatically be recognized as compliance with BART.

¹³ See 42 USC § 7491(b)(2)(A).

¹⁴ Memorandum from William L. Wehrum, Acting Assistant Administrator to Regional Administrators, EPA Regions 1-10, *Guidance for Setting Reasonable Progress Goals under the Regional Haze Program*, 4-2 – 4-3 (June 1, 2007); see also *id.* at 5-1, stating that "the significant emissions reductions that we anticipate to result from BART, the CAIR, and the implementation of other CAA programs . . . may be all that is necessary to achieve reasonable progress in the first planning period for some States."

¹⁵ See 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34,218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38,006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39,177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24,340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35,287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16,937 (March 23, 2012) (West Virginia).

¹⁶ 42 USC § 7491(b)(2)(A).

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Furthermore, the CAA includes separate definitions for determining what is “reasonable progress” and for determining what is “best available retrofit technology.”¹⁷ Though similar, by drafting two different definitions, the intent of the Congress is clear that these terms are to be applied separately and distinctly. If Congress intended the regional haze provisions to be applied in a way to require BART limitations on non-BART units, let alone limitations that are even more strenuous than BART, as EPA’s proposal here would do, Congress would have said so. This fact, and the limitations that Congress put on EPA’s actions, have been ignored by EPA in this Proposed FIP. EPA must withdraw its proposed emission limits on both the BART and non-BART EGUs.

III. Texas’ reasonable progress analysis and associated SIP submission complies with all CAA requirements and must be approved.

Texas’ reasonable progress analysis complies with all statutory and regulatory requirements. EPA’s proposal to disapprove Texas’ SIP submission regarding reasonable progress is arbitrary, capricious, and not supported by the facts or law. As EPA itself has admitted, EPA’s “individual source” and “visibility benefit” approach for Texas is “without...prior precedent.”¹⁸ Rather than deferring to Texas’ reasoned judgment and its extensively supported SIP, EPA has inappropriately decided to deny Texas’ reasonable progress analysis based on “how [Texas] analyzed and weighed the four reasonable progress factors,”¹⁹ and more specifically, how Texas considered potential visibility benefits of the considered control strategies.²⁰

a. Texas properly conducted the four-factor analysis required by the CAA; there is no statutory requirement to consider a “fifth” visibility factor.

As an initial matter, EPA does not have the statutory right to dictate “how” a state analyzes the four factors and, in this instance, has far overstepped its bounds in its questioning of Texas’ four-factor analysis. EPA itself has acknowledged, “[s]tates have considerable flexibility in how they take these factors into consideration.”²¹ There is no required emissions or visibility target, but rather, the requirement that states analyze the four-factors; the statute therefore requires that the EPA approve a state’s reasonable progress goals so long as the required analysis was performed. Therefore, under even a strict statutory standard, Texas has fully met this statutory burden, performed the required analysis,²² and considering the flexibility that the CAA provides to the states (as recognized by EPA), EPA simply has no basis to deny its submission.

¹⁷ *Id.* at § 7491(g)(1-2).

¹⁸ Declaration of Sam Coleman, *Nat’l Parks Conservation Ass’n v. McCarthy*, No. 11-01548, at 5 (D.D.C. 2014).

¹⁹ TX TSD at 18. (emphasis added).

²⁰ Proposed FIP, 79 Fed. Reg. at 74838.

²¹ Idaho SIP Approval Proposal, 77 Fed. Reg. at 30251.

²² See TX TSD at 55, stating that “[t]he CENRAP states’ modeling, described in Section 8 of the Texas Regional Haze SIP, was developed consistent with our guidance.”

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EPA has no real substantive complaints regarding Texas' analysis of the four-statutory factors. Rather, EPA's denial was based on Texas' alleged failure to analyze a "fifth" factor in its analysis – visibility – in a manner that EPA prefers. As stated by EPA:

“While visibility is not an explicitly listed factor to consider when determining whether additional controls are reasonable, the purpose of the four-factor analysis is to determine what degree of progress toward natural visibility conditions is reasonable. Therefore, we consider it appropriate to consider the projected visibility benefit of the controls when determining if the controls are needed to make reasonable progress.”²³

EPA's determination that visibility is an “appropriate” consideration is completely without statutory basis. In fact, it contradicts the statutory language itself. The CAA defines the four factors to be reviewed regarding reasonable progress, which does not include visibility. This is not an oversight or accidental, but rather, an intentional act of omission by the Congress. Immediately following the criteria for determining “reasonable progress” are the criteria for determining “BART,” which includes a fifth visibility factor.²⁴ If Congress intended the states to consider visibility on par with the other factors, or to provide EPA the authority to impose this consideration on the states as EPA attempts to do here, this fifth factor would have been included in the reasonable progress criteria. Ultimately, “EPA overstepped the bounds of its narrow statutory role in the SIP approval process” and acted “ultra vires” by relying on a “factor[] which Congress has not intended [EPA] to consider.”²⁵

While EPA cannot require Texas to consider this fifth factor, Texas, in its discretion, did consider visibility, and thus EPA's proposal is further in error. Regarding the visibility analysis that Texas did conduct as part of its SIP, it is important to note that this was an exercise of a purely discretionary matter. A right afforded to Texas under the flexibility of the CAA, it does not provide EPA a basis to disapprove of a discretionary analysis that is required by neither statute nor regulations.

²³ TX TSD at 22.

²⁴ Compare language at 42 USC § 7491(g):

- (1) in determining reasonable progress there shall be taken into consideration the costs of compliance, the time necessary for compliance, and the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements;
- (2) in determining best available retrofit technology the State (or the Administrator in determining emission limitations which reflect such technology) shall take into consideration the costs of compliance, the energy and nonair quality environmental impacts of compliance, any existing pollution control technology in use at the source, the remaining useful life of the source, and the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology;

²⁵ See *Luminant Generation Co. LLC v. EPA*, 675 F.3d 917, 925, 926 (5th Cir. 2012) (internal quotations and citations omitted).

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Even if EPA did have the ability to impose a fifth “visibility factor,” Texas’ choice of a 0.5 deciview (“dv”) threshold as a benchmark for total visibility improvement was entirely reasonable. For example, in recently reviewing and approving Idaho’s reasonable progress goals, EPA “independently evaluated whether there are reasonable control measures available for sources located within Idaho’s regulatory jurisdiction” and concluded that facilities with visibility impacts of 0.5 dv or less at the nearest Class I area were “relatively small.”²⁶ Therefore, EPA ultimately concluded in Idaho that additional controls for “reasonable progress purposes [were] not reasonable at [that] time, because even though there [were] cost effective controls identified, visibility improvement [was] anticipated to be relatively small.”²⁷

b. There is no statutory basis to disapprove of Texas’ SIP based on “additional analysis” on a “small group” of individual sources.

EPA does not have the authority to disapprove Texas’ SIP submission based on an unfounded assertion that Texas was required to conduct a four-factor analysis on an individual-source basis. EPA states in the Proposed FIP that:

“Because individual sources were not considered by the [Texas Commission on Environmental Quality (“TCEQ”)], we found it is necessary to conduct an additional analysis to determine whether this approach materially affected the outcome of the TCEQ analysis. As we demonstrate in detail in our FIP TSD, by analyzing sources individually, we believe we have identified a small number of sources that are responsible for much of Texas’ collective visibility impact on the Texas’ Class I areas, which if controlled, would provide for visibility benefit at Texas’ Class I areas.”²⁸

EPA goes on to add in its TX TSD that:

“Because it only estimated the visibility benefit of all the controls together, the TCEQ was not able to assess the potential benefit of controlling individual sources with significant, and potentially cost-effective, visibility benefits.”²⁹

EPA contends that Texas should have “separately evaluate[d] the visibility benefit from the implementation of [individual] control[s].”³⁰ Besides the fact that visibility is not one of the factors that Texas is required to analyze, as discussed above, there is simply no basis for this type of review in statutory law, regulatory provisions, guidance, EPA’s recent regional haze SIP submittal decisions, and recent case law.

²⁶ Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256.

²⁷ *Id.*

²⁸ Proposed FIP, 79 Fed. Reg. at 74839.

²⁹ TX TSD at 19.

³⁰ Proposed FIP, 79 Fed. Reg. at 74839.

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Reviewing the statutory structure of the CAA, it is clear that there is no requirement to evaluate and impose individual controls as part of a reasonable progress analysis. This is echoed in EPA's regulations, which focus on reasonable progress requirements viewed as whole from numerous source categories, not individual sources or even a small number of sources. For example, the regulations require states to consider the four factors to "address regional haze,"³¹ which is defined as "visibility impairment that is caused by the emission of air pollutants from numerous sources located over a wide geographic area. Such sources include, but are not limited to, major and minor stationary sources, mobile sources, and area sources."³²

EPA's guidance has supported this conclusion that the reasonable progress requirements do not require a source-specific analysis, stating:

Unlike the technical demonstration for CAIR or BART, the reasonable progress demonstration involves a test of a strategy. The strategy includes a suite of controls that has been identified through the identification of pollutants and source categories of pollutants for visibility impairment - the possible controls for these pollutants (and their precursors) and source categories - the application of four statutory factors and how much progress is made with a potential strategy with respect to the glide path. Modeling occurs with a strategy and is not a source-specific demonstration like the BART assessment.

...
Reasonable progress is not required to be demonstrated on a source-by-source basis. It is demonstrated based on a control strategy developed from a suite of controls that has been assessed with the four statutory factors and the uniform rate of progress.³³

EPA has also, on numerous recent occasions, approved of SIPs that did not require source-specific requirements, but rather, looked more broadly at source categories. For example, EPA recently approved the reasonable progress goals submitted by Idaho based on the state's "general level of review for the major source categories."³⁴ Finally, and likely most importantly, EPA's decision to require source-specific analysis and limitations conflicts with the decision of the U.S. Court of Appeals for the Tenth Circuit, which recently held "[n]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable

³¹ 40 CFR § 53.308(d).

³² 40 CFR § 51.301.

³³ See EPA, *Additional Regional Haze Questions*, 9 (Sept. 27, 2006 Revision). Available at: https://www.tceq.texas.gov/assets/public/implementation/air/sip/bart/EPA_QA-Haze.pdf

³⁴ See Idaho SIP Approval Proposal, 77 Fed. Reg. at 30256; see also Approval and Promulgation of Implementation Plans; State of Idaho; Regional Haze State Implementation Plan, 77 Fed. Reg. at 66929, 66929 (Nov. 8, 2012).

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progress.”³⁵ Ultimately, EPA has no authority to impose source-specific emissions limits for SO₂, or any other pollutant, on any source in Texas. EPA must approve Texas’ SIP.

c. EPA’s decision to disapprove the RPG for the Guadalupe Mountains directly conflicts with its earlier findings in its consideration of the New Mexico SIP.

EPA proposes to disapprove Texas’ RPG of 16.3 dv for the Guadalupe Mountains. This is despite the fact that EPA has already approved a higher RPG of 16.92 dv set by New Mexico for the Carlsbad Caverns National Park. These are contiguous parks that share the exact same, single, air quality monitor as the Guadalupe Mountains. Texas relied on similar rationale as did New Mexico to establish its RPG for this area, and if any conclusion should have been reached by EPA, it was that Texas’ RPG was too stringent and should be relaxed based on EPA’s prior decision. EPA’s proposal to disapprove Texas’ RPG for this area is the definition of an arbitrary and capricious action.

d. EPA has no basis to deny Texas’ natural visibility and uniform rate of progress findings for the Big Bend and Guadalupe Mountain Areas.

Texas calculated natural visibility conditions for Big Bend at 10.09 dv and the Guadalupe Mountains at 12.26 dv, for the 20% worst days.³⁶ Texas’ determination was based on a review of data and technical analyses for these two specific Class I areas. Rather than finding any fault with Texas’ area-specific analysis, EPA has proposed to use a default value for natural conditions, even though EPA itself believes that this does not accurately reflect natural conditions for these two areas.³⁷ Without a sound basis for this disapproval, EPA’s action to disapprove Texas’ submission regarding natural visibility, and the resulting uniform rate of progress, is an arbitrary and capricious act.

IV. Texas’ long-term strategy and associated SIP submission complies with all CAA requirements and must be approved.

a. EPA has met all consultation requirements found in the regional haze long-term strategy regulations.

EPA believes that Texas “did not adequately address the requirement in Section 51.308(d)(3)(i) to ‘consult with the other state(s) in order to develop coordinated emission management strategies.’”³⁸ This is largely based on EPA’s belief that “the technical analysis developed by Texas to evaluate controls for Texas sources did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop

³⁵ *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014).

³⁶ Revisions to the State Implementation Plan (SIP) Concerning Regional Haze, TCEQ, 5-3 (Feb. 25, 2009) (“2009 Texas SIP Narrative”).

³⁷ FIP TSD at 32.

³⁸ TX TSD at 49.

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coordinated management strategies with Oklahoma.”³⁹ This is simply not true and directly conflicts with the numerous meetings, interactions, and affirmative approvals, between Texas and Oklahoma administrative agencies.

Texas has fully complied with the consultation requirements outlined in the LTS regulations⁴⁰ with regard to the Central Regional Air Planning Association (“CENRAP”) states, including Oklahoma. Texas and Oklahoma engaged in lengthy and detailed consultation in the development of their regional haze SIPs. Some of these examples of consultation include:

- “Texas wrote consultation letters to Arkansas, Missouri, Oklahoma, New Mexico, Louisiana, and Colorado to ask whether emission reductions projected in Texas by 2018 are sufficient to meet Texas’ apportionment of the impact reduction needed to meet the RPG for each Class I area in each state.”⁴¹ Texas also “requested recipients of the letters to confirm they were not expecting any additional emission reductions from Texas sources.”⁴² Notably, “none of these states [...] asked [Texas] for further emission reductions to help it meet its reasonable progress goals for its Class I area(s).”⁴³
- “TCEQ attended Oklahoma’s three consultation calls held in August and September 2007.”⁴⁴
- In August 2007, Oklahoma wrote to Texas to “formalize comments submitted through the TCEQ consultation process in regard to Texas impacts on the Wichita Mountains,” and to request that Texas “require new and modified PSD sources to conduct analyses for their impact on visibility in the Wichita Mountains;” “opportunity to review and comment on BACT determinations for the proposed projects” and other demands. Oklahoma expressed its desire that the two states “continue to work cooperatively.”⁴⁵
- Texas responded to Oklahoma’s request on October 15, 2007, recognizing “that the modeling shows Texas to be a significant source of visibility impairing pollution in the Wichita Mountains” but explaining that “there will be significant reductions in emissions from Texas in the next several years, and visibility at the Wichita Mountains will improve as a result of these reductions;” agreed that Oklahoma was “welcome to review” PSD permits and provide comments; agreed to “notify the Oklahoma DEQ, along with the relevant [Federal Land Manager (“FLM”)], whenever modeling indicates that a proposed source may significantly impact the Wichita Mountains;” and agreed to work

³⁹ *Id.*

⁴⁰ 40 CFR § 51.308(d)(93)(ii).

⁴¹ Proposed FIP, 79 Fed. Reg. at 74854.

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*, 79 Fed. Reg. at 74855.

⁴⁵ Letter from Steven Thompson, Executive Director, Oklahoma Department of Environmental Quality (“ODEQ”), to Glenn Shankle, Executive Director, TCEQ (Aug. 3, 2007).

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“with the FLMs on mutually acceptable criteria for determining when a proposed PSD source should conduct a Class I review.”⁴⁶

- In a March 25, 2008 letter, Texas again consulted with Oklahoma to share information it developed “on emissions that modeling and analysis indicate affect the Class I area in [Oklahoma].” Texas also noted that the March 2008 letter was “intended to be the culmination of [the] consultation process for” the Regional Haze SIP. In regard to impacts on the Wichita Mountains, Texas explained its analysis of modeling results, and other factors, concluding that the probable impact of Texas sources will be reduced by 2018. Texas explicitly requested “Oklahoma’s concurrence on this assessment and a verification that [Oklahoma] is not depending on any additional reductions from Texas sources in order to meet [Oklahoma’s] reasonable progress goal(s).”⁴⁷
- In a May 12, 2008 letter, Oklahoma concurred with Texas’ request; did not request any further reductions from those already required and anticipated from existing programs; and confirmed that the reasonable progress goals it had established for the Wichita Mountains did not rely on further reductions from Texas, and that it reached these goals through the CENRAP deliberation.⁴⁸ Oklahoma specifically stated that the reasonable progress goal for the Wichita Mountains “does not anticipate emissions reductions beyond those that [Texas] already plan[s] to implement and upon which CENRAP modeling studies have relied.”⁴⁹ Oklahoma further acknowledged Texas’ commitment to satisfy Oklahoma’s request to analyze certain sources “within 300 km of the Wichita Mountains” and the “opportunity to review and comment” on various BACT determinations.⁵⁰ Oklahoma affirmed the cooperative nature of the consultation process, stating that it believes it is “important that Oklahoma and Texas continue to work cooperatively to improve air quality in the region and to make reasonable progress toward visibility goals for the Wichita Mountains Class I area.”⁵¹

EPA has already recognized the extensive information that was in Oklahoma’s possession as it was developing its SIP. In an attempt to disagree with the reasonable decisions made by Oklahoma in developing its SIP, EPA stated “[a]t the time that Oklahoma was developing its SIP, it had...abundant information showing the impact of Texas sources on visibility at the Wichita Mountains.”⁵² While this impact did not warrant additional controls, as reasonably determined by both Texas and Oklahoma cooperatively, EPA’s statement clearly illustrates that

⁴⁶ Letter from Glenn Shankle, Executive Director, TCEQ, to Steve Thompson, Executive Director, ODEQ (Oct. 15, 2007); *see also* Proposed FIP, 79 Fed. Reg. at 74855.

⁴⁷ Letter from Susana M. Hildebrand, Air Quality Division Director, TCEQ, to Eddie Terrill, Air Quality Division Director, ODEQ, Mar. 25, 2008).

⁴⁸ Letter from Eddie Terrill, Air Quality Division Director, ODEQ, to Susana M. Hildebrand, Air Quality Division Director, TCEQ, (May 12, 2008).

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² Proposed FIP, 79 Fed. Reg. 74867.

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Oklahoma was in possession of “abundant information.” Further, EPA has admitted that “Oklahoma did not specifically request any additional reductions from Texas sources.”⁵³

Oklahoma had all necessary information to develop an appropriate regional haze SIP, and in its reasonable discretion, chose not to request additional controls in Texas beyond those required by existing programs. While EPA may disagree with that choice – though GCLC believes that Oklahoma’s choice was valid – it is not a valid legal basis to disapprove Texas’ long-term strategy, because the evidence is clear that there was extensive consultation between Oklahoma and Texas. Texas met and exceeded all consultation requirements and all regulatory requirements, and Texas’ SIP includes all measures “to achieve its apportionment of emission reduction obligations agreed upon through [the regional planning] process.”⁵⁴

GCLC would also note that EPA’s analysis directly conflicts with its recent decision on Nebraska’s regional haze SIP, where it found that Nebraska’s SIP complied with the LTS requirements. In the SIP development process, South Dakota (the state with Class I areas potentially impacted by Nebraska) had the opportunity to comment on Nebraska’s SIP, but “did not ask for additional reductions from Nebraska.”⁵⁵ Given South Dakota’s action, EPA found that Nebraska had “demonstrate[d] that it has included all measures necessary to obtain its share of the emission reductions needed to meet the RPGs for Class I areas where it causes or contributes to impairment” and had met its LTS obligations to South Dakota.⁵⁶

An important factual distinction exists between the Nebraska-South Dakota cooperation, compared to the Texas-Oklahoma cooperation, further underscoring that EPA’s proposal here is unjustified. In the Nebraska SIP process, Nebraska represented to South Dakota that it would impose sulfur dioxide (“SO₂”) emission limits on a specific BART emissions source that it ultimately did not adopt.⁵⁷ EPA, rather than disapproving of Nebraska’s LTS for failing to include this measure that South Dakota relied on, recommended addressing this issue in the second planning period.⁵⁸ With regard to the Texas SIP, Texas’ long-term strategy includes all of the actions it agreed with Oklahoma to take, and thus there is no basis for EPA’s proposed additional controls. But even if there were, those issues should be addressed in the next planning period, consistent with EPA’s action on the Nebraska SIP. This lack of basis for EPA’s action, as well as the inequality between the different SIP review processes, simply does not make sense and is arbitrary and capricious.

⁵³ *Id.* at 74856

⁵⁴ 40 CFR § 51.308(d)(3)(ii). (emphasis added).

⁵⁵ Nebraska SIP Final Rule, 77 Fed. Reg. at 40155.

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.*

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b. EPA's three new interpretations of regulations found in 40 CFR § 51.308(d)(3) conflict with the plain language of the regulations and are no basis for disapproving Texas' SIP.

EPA has proposed three new interpretations of the LTS-related regulations, all of which EPA relies on to disapprove certain elements of Texas' SIP. EPA's interpretations, as discussed below, conflict with the plain language of the LTS regulations. EPA is also effectively pulling a bait-and-switch on Texas, redefining regulations that have consistently been applied, in a way that arbitrary and capriciously prejudices Texas. These new and unfounded interpretations are an unlawful basis for EPA's proposal and do not warrant any deference, as claimed by EPA.

1) Reinterpretation of "Progress Goal"

EPA seeks to reinterpret the requirements found at 40 CFR § 51.308(d)(3)(ii) by requiring that Texas' demonstration must be based on progress goals that are "approved or approvable" by EPA.⁵⁹ This conflicts with the plain language of the regulations that require the upwind state (Texas) to base its long-term strategy on the "progress goal" "established by" the downwind state (Oklahoma); at no time during the states' coordination process is EPA approval of the progress goal necessary or even possible. Through Texas' coordination with Oklahoma and its agreed upon progress goals, Texas' LTS met the reasonable progress goal established by Oklahoma for the Wichita Mountains. Regardless of the actions that EPA is attempting to take regarding the Oklahoma SIP, Texas' submission fully complies with the requirements of the CAA and associated regulations and must be approved.

2) Interpretations requiring four factor analysis for intra and interstate Class I Areas.

EPA's proposal to require Texas to conduct the four factor analysis for the Wichita Mountains, a Class I area outside of the state, completely contradicts the language and intent of the CAA and implementing regulations. Oklahoma has already conducted that analysis, and EPA is in effect asking for Texas to develop its own reasonable progress goal for the Wichita Mountains. This is a duplicative analysis that is not required by law. There is nothing in 40 CFR § 51.308(d)(3)(ii) that requires a four factor analysis. The LTS regulations state that: "[t]he State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants."⁶⁰ This is exactly what Texas did through its participation with the states in its regional planning organization ("RPO"), and to which EPA has no apparent objection.

⁵⁹ 79 Fed Reg. at 74,829.

⁶⁰ 40 CFR § 51.308(d)(3)(iii). (emphasis added).

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The regional haze regulations only require a State to conduct a four-factor analysis for Class I areas within the state.⁶¹ The LTS regulations discussing out-of-state impacts to Class I areas, as discussed above, only require the apportionment of emissions reductions obligations to meet other states' RPGs that have already been established.⁶² Further, the LTS includes a list of factors for consideration in the LTS for Class I Areas outside the state, but this is a list of seven factors that are completely different, in both language and intent, than the reasonable progress four factors.⁶³

Ultimately, EPA "believe[s] the record supports a finding that [Texas'] analysis is inadequate as it does not provide the information necessary to determine the reasonableness of controls at those sources in Texas that significantly impact visibility at the Wichita Mountains."⁶⁴ But as discussed above, Oklahoma has all information necessary to determine the reasonableness of controls and EPA's attempt to reinterpret the rules does not impose any additional burdens. Texas has met its LTS obligations.

V. Every factor of EPA's proposed reasonable progress analysis fails.

Separate from the fact, as discussed above, that the four-factor analysis for the purpose of Texas' SIP has no relation or bearing on Texas' LTS analysis, EPA has failed to demonstrate that its proposed FIP will comply with the four-factor analysis for determining reasonable progress.⁶⁵ The Proposed FIP will result in miniscule and non-perceivable changes in visibility compared to the Texas SIP; at the same time, it will cause serious economic harm and jeopardize electric reliability in the state, all while imposing requirements that would extend beyond the planning period.

One of the primary reasons EPA's analysis is so flawed is due to its reliance on the BART guidelines and EPA's insistence on applying source-specific limitations for a rule that is meant to look beyond specific sources and look at source-categories or state-wide contributions more broadly. This is not to say that EPA's source-specific four-factor analysis is correct, either, as it seriously underestimates the harms of the rule to those individual units regarding all of the factors of the reasonable progress analysis.

a. Costs of Compliance and Visibility Improvements

The costs of compliance, especially for units required to retrofit with new scrubbers, are astronomical and could likely force the shutdown of the impacted EGUs. BART standards, which EPA uses as guidance, were never intended to be a vehicle to shutdown an existing source

⁶¹ See 40 CFR § 51.308(d)(1)(i), which only lists the four factors in relation to "establishing a reasonable progress goal for any mandatory Class I Federal area within the State." (emphasis added).

⁶² See 40 CFR § 51.308(d)(3)(iii).

⁶³ 40 CFR 51.308(d)(3)(V)(A-G).

⁶⁴ *Id.*

⁶⁵ See 42 USC § 7491(g)(1).

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with decades of remaining useful life. A technology is not a cost-compliant “available retrofit” if it forces the shutdown of the unit.

Regarding scrubber upgrades, EPA believes that “any reasonable amount of visibility improvement due to their installation justifies their cost.”⁶⁶ In other words, EPA does not even consider cost-effectiveness as a factor in its analysis. But this is not the purpose or intent of regional haze rules, which clearly require a more measured approach to assessing cost impacts. As demonstrated by EPA’s own data, the net effect on visibility is virtually imperceptible statewide – there is no “reasonable amount of visibility improvement.” This is compared to costs that total in the aggregate of over \$2 billion.⁶⁷

Considering the “degree of improvement in visibility,” compared to the costs of compliance, EPA should avoid imposing the limitations contemplated in the FIP. The simplest cost-benefit analysis would demonstrate this. However, one of the key reasons EPA failed to appropriately consider the costs of compliance is because, apparently, EPA never actually attempted to balance or compare the costs of the rule with the alleged visibility impacts. EPA’s analysis was merely superficial, reviewing costs in one TSD (i.e. the Cost TSD) and visibility improvements (i.e. the FIP TSD) without making any real comparison. If EPA had, it would realize that there is no way EPA could claim that the controls are cost effective.

b. Time Necessary for Compliance

EPA has proposed that seven Texas coal-fired EGUs will be required to install scrubbers in 2020. This is beyond 2018, the year when the first regional haze period ends. This violates the “time necessary to comply” factor. Since these controls cannot be installed by the end of this first planning period, consideration of these types of controls must be deferred until the conclusion of the next planning period. While EPA may want to now act quickly, it is not the fault of Texas or its operators that a plan submitted in 2009 is only now being reviewed and EPA is only now proposing its FIP. EPA’s delay does not excuse, or provide reason, to go beyond the limits of the phased implementation schedule. Furthermore, since a scrubber cannot be installed by 2018, that means there is no requirement to install such scrubber on the targeted Texas units. The question of whether these units must install controls, therefore, can only be addressed by Texas in the second planning period, not by EPA in this current period. EPA has acted too soon and without legal authority.

c. Energy and Nonair Quality Environmental Impacts of Compliance

EPA believes that energy concerns will not be significant, because once again, by relying on BART Guidelines, EPA has only taken a narrow view of the energy penalties of controls at each individual unit. However, viewed on a larger scale (i.e. statewide) the energy impacts of

⁶⁶ Proposed FIP, 79 Fed. Reg. at 74884.

⁶⁷ TCEQ, TCEQ Response to EPA’s Proposed Action on Regional Haze Plan, Nov. 24, 2014. Available at: <http://www.tceq.state.tx.us/news/releases/11-14-eparegionhaze>. (Last modified: Nov. 24, 2014).

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complying with the Proposed FIP may be significant, particularly in the Electric Reliability Council of Texas (“ERCOT”) region. EPA has failed to consider these broader impacts of its proposal.

ERCOT is predicting that by 2020, ERCOT will have a reserve margin of 12.4%.⁶⁸ By 2024, this reserve margin will shrink to 7.3%, far below the 13.75% target margin for the region and the margin that the North American Electric Reliability Corporation (“NERC”) demands. The Proposed FIP will impact 10,131 megawatts (MW) of installed Texas capacity either through forced scrubber upgrades or scrubber retrofits.⁶⁹ If the ERCOT units targeted with scrubber retrofits are forced to retire, this would take 2,972 MW off of the ERCOT grid, reducing the reserve margin to 8.3% in 2020 and 3.3% in 2024, which places the grid in substantial jeopardy when it comes to preserving reliability.

Importantly, ERCOT’s estimates regarding predicted capacity and demand **do not include** the impacts of environmental rules. Therefore the predicted impacts of the Clean Power Plan, the 316(b) Rule, the Mercury and Air Toxics Rule (“MATS”) and others are not reflected in this shortfall calculation. Therefore, the predicted reserve margin will be even lower than stated above.

EPA’s Proposed FIP could have a very significant effect on energy/electricity availability in the state, which is a clear and convincing reason that EPA should not continue with its Proposed FIP or impose the source-specific limitations it contemplates. This was something that was not accounted for by EPA in its cost analysis, nor in its analysis of energy impacts.

d. Remaining Useful Life

EPA attempts to claim that the remaining useful life of the units indicates that the costs of controls will not be significant, because the costs can be distributed over the remaining life of the targeted EGUs. However, this is seriously misguided. Particularly for units that EPA anticipates will have to have scrubber retrofits, there is a very high probability that the unit will cease to operate. While there may be decades of useful life remaining, it would be extremely difficult in Texas’ competitive electricity market to justify the installation of controls nearing \$300 million for each unit; and those costs are based on EPA’s estimates, when in reality, the costs will likely be much higher.

⁶⁸ ERCOT, Report on the Capacity, Demand, and Reserves in the ERCOT Region, 2015-2024, 9 (Dec. 1, 2014). Available at: <http://www.ercot.com/content/gridinfo/resource/2014/adequacy/cdr/CapacityDemandandReserveReport-Dec2014.pdf>.

⁶⁹ See U.S. Energy Information Administration, Form EIA-860 Annual Electric Generator Report, 2012 Data, available at <http://www.eia.doe.gov/cneaf/electricity/page/eia860.html>.

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VI. EPA has violated its regional consistency regulations by applying different and more stringent standards on Texas units compared to other states and regions.

EPA's Proposed FIP imposes unprecedented limitations on Texas through a completely novel means. This includes conducting an "additional analysis," creating a new fifth visibility factor, and imposing source-specific SO₂ emissions limitations on 15 separate BART-compliant and BART-exempt Texas EGUs a type of analysis or limitation that EPA has not imposed on any other state through the regional haze SIP/FIP process. This is also a contradiction of EPA's own rulemaking that CSAPR (and previously CAIR) serves as better-than BART for BART sources, and this goes far beyond any other type of limitations considered for non-BART sources in the statute, regulations, guidance documents, and every other review of other states' SIP submission. Some of the specific examples where EPA has acted inconsistently with prior actions have already been referenced in our comments above (e.g., EPA's actions on the Idaho and Nebraska SIP submissions) but extend far beyond those. This includes EPA's recent approvals of reasonable progress evaluations, where states have taken the same approach and reached the same results as Texas, and EPA has approved them.⁷⁰

By EPA's own admission, its FIP required a "thorough technical and policy analysis" in order to "ensure compliance with the Regional Haze Rule," because EPA is proposing the rule "without the benefit of prior precedent to streamline the process."⁷¹ This is despite Texas' FIP being proposed after years of EPA's regional haze SIP/FIP determinations for numerous states. By taking this inconsistent and much-more burdensome path for Texas and Texas EGUs, EPA's Proposed FIP is in clear contravention to the regional consistency regulations found at 40 CFR,

⁷⁰ See Approval and Promulgation of Implementation Plans; Region 4 States; Visibility Protection Infrastructure Requirements for the 1997 and 2006 Fine Particulate Matter National Ambient Air Quality Standards, Final Rule, 79 Fed. Reg. 26,143, 26,145-46 (May 7, 2014), which included:

"Regarding the reasonable progress evaluations, each state at issue focused its reasonable progress analysis on SO₂ emissions based on the conclusion that sulfate particles account for the greatest portion of the regional haze affecting Class I areas in these states. Each state then established areas of influence and contribution thresholds to determine which of its sources should be evaluated for reasonable progress control. EPA approved each state's methodology for identifying units for reasonable progress evaluation and each state's reasonable progress determinations in the respective regional haze SIP actions and provided a detailed discussion of the methodology and the rationale for approval in the Federal Register notices associated with those actions.

Contrary to the Commenter's assertions, Alabama, Georgia, Kentucky, North Carolina, and South Carolina did not "exempt [CAIR] sources . . . that would otherwise be subject to reasonable progress review." Each of these states considered the four statutory reasonable progress factors in evaluating whether CAIR would satisfy reasonable progress requirements for the state's EGU sector and determined that no additional controls beyond CAIR were reasonable for SO₂ during the first planning period. As discussed in EPA's Reasonable Progress Guidance, states may evaluate the need for reasonable progress controls on a source category basis, rather than through a unit-specific analysis, and have wide latitude to determine additional control requirements for ensuring reasonable progress. The guidance also notes that states may consider emissions reductions from cap-and-trade programs such as CAIR in addition to source-specific controls."

⁷¹ Declaration of Sam Coleman, *Nat'l Parks Conservation Ass'n v. McCarthy*, No. 11-01548, at 5 (D.D.C. 2014). (emphasis added).

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Part 56 – Regional Consistency. It is also in clear contravention of the recent D.C. Circuit holding in *National Environmental Development Association's Clean Air Project v. EPA*, which held that directives contravening the regional consistency regulations are a violation of law.

VII. EPA's proposed disapproval of Texas' infrastructure SIP submittals for interstate transport and visibility protection is contrary to the CAA.

EPA has no basis to disapprove portions of Texas' SIP demonstrating compliance with various National Ambient Air Quality Standards ("NAAQS"). EPA is, therefore, acting contrary to the CAA. Texas' SIP submittals comply with all requirements of the CAA and must be approved.

As an initial matter, EPA has interpreted the relevant CAA provisions incorrectly in this Proposed FIP. EPA is attempting to impose substantive requirements and emissions limitations via the 42 USC § 7410(a)(2)(D)(i)(II), rather than what is clearly contemplated in the CAA – a requirement to have structural requirements in place. This present-day interpretation conflicts with EPA's own historical interpretation of this CAA provision, including that the purpose of this provision is to "assure that the air agency's SIP contains the necessary structural requirements for the new or revised NAAQS."⁷² EPA has gone on to add that "the infrastructure SIP submission process provides an opportunity for the responsible air agency, the public, and the EPA to review the basic structural requirements of the air agency's air quality management program in light of each new or revised NAAQS."⁷³ EPA has expressed no disapproval of the structural elements of Texas' SIP submission, but rather, claims that because Texas did not comply with 42 USC § 7491 (which as demonstrated throughout this letter, GCLC strongly believes that Texas has complied), Texas has somehow not met the structural SIP requirement found at 42 USC § 7410(a)(2)(D)(i)(II). However, 42 USC § 7491 is not a structural component of Texas' SIP, and therefore, cannot be applied to Texas via the 7410 provision. Therefore, EPA is in error.

EPA's proposed disapproval of Texas' infrastructure SIPs also conflicts with the timing of NAAQS and regional haze SIP submittal deadlines. As these are separate programs, there is no statutory or regulatory syncing of timelines between these two programs. But if EPA continues to proceed with this proposed plan of effectively reading the substantive requirements of 42 USC § 7491 into 42 USC § 7410(a)(2)(D)(i)(II), it would force states to disregard the regional haze SIP deadlines in favor of the NAAQS deadlines. This result contradicts the clear requirements of the CAA and highlights the errors of EPA's proposed action.

EPA refers to the "protect visibility" requirement of 42 USC § 7410(a)(2)(D)(i) as "Prong 4" in its guidance on infrastructure SIPs, interpreting "this prong to be pollutant-specific, such that the infrastructure SIP submission need only address the potential for interference with protection of visibility caused by the pollutant (including precursors) to which the new or revised NAAQS

⁷² EPA, *Guidance on Infrastructure State Implementation Plan (SIP) Elements under Clean Air Act Sections 110(a)(1) and 110(a)(2)*, at 2 (Sept. 2013). (emphasis added).

⁷³ *Id.* (emphasis added).

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applies.”⁷⁴ While GCLC opposes EPA’s entire Proposed FIP and does not believe EPA has a basis to impose limits or restrictions for SO₂ or for any other type of pollutant, EPA’s action to impose disapprovals with respect to the PM_{2.5}, NO₂, and ozone NAAQS is completely unsupported and arbitrary and capricious given that EPA has found no error in Texas’ program regarding those pollutants or a visibility effect from those pollutants. Ultimately, since Texas has fully complied with the requirements of the CAA through its SIP submission, while also complying with the infrastructure SIP requirements, EPA must approve of Texas’ SIP submittals.

VIII. EPA may not issue this FIP prior to providing Texas the opportunity to submit a SIP responsive to EPA’s determination that Texas’ 2009 SIP submission was inadequate.

In contravention of the language and intent of the CAA, EPA is attempting to disapprove the SIP and immediately move to a FIP. The CAA provides opportunities to states to correct deficiencies in SIPs, providing the Administrator up to two years to promulgate a FIP in response to a finding that a SIP was inadequate.⁷⁵ This is particularly relevant in this FIP, as EPA has taken numerous novel steps, including new and unprecedented interpretations of existing regulations, in order to disapprove this SIP. While EPA’s proposed disapproval of Texas’ SIP and its proposed FIP lack merit, Texas still must be given the opportunity to respond – and if appropriate – revise elements of its SIP prior to EPA issuing this FIP.⁷⁶ To do otherwise violates the CAA and unfairly burdens Texas EGUs.

Further, EPA in its recent rulemaking regarding Arkansas’ regional haze SIP submittal “elect[ed] to not promulgate a FIP” at the time it issued its partial SIP approval/disapproval “in order to provide Arkansas time to correct [the] deficiencies” indicated by EPA. This is another example of the unfair and unequal treatment of Texas.

IX. EPA’s Regional Haze FIP is not a rule of “nationwide scope and effect.”

EPA declares in the preamble of the Proposed FIP that “this is a rulemaking of nationwide scope or effect such that any petitions for review must be filed in the U.S. Court of Appeals for the District of Columbia Circuit.”⁷⁷ EPA’s position is both factually and legally incorrect.

⁷⁴ *Id.* at 33.

⁷⁵ 42 USC 7410(c).

⁷⁶ EPA provided such opportunity to Arkansas regarding its regional haze SIP submittal, where EPA “elect[ed] to not promulgate a FIP” at the time it issued its partial SIP approval/disapproval “in order to provide Arkansas time to correct [the] deficiencies” indicated by EPA. In fact, it took over three years for EPA to proceed with a FIP. See Approval and Promulgation of Implementation Plans; Arkansas; Regional Haze State Implementation Plan; Interstate Transport State Implementation Plan To Address Pollution Affecting Visibility and Regional Haze, Final Rule 77 Fed. Reg. 14604, 14672 (Mar. 12, 2012); *see also* Promulgation of Air Quality Implementation Plans; State of Arkansas; Regional Haze and Interstate Visibility Transport Federal Implementation Plan, 80 Fed. Reg. 18944 (Apr. 8, 2015).

⁷⁷ Proposed FIP, 79 Fed. Reg. at 74888.

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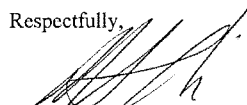
The Proposed FIP addresses only two states' SIP submissions – Texas and Oklahoma. Grouping these two states in a single SIP submission does not make a rule one of “nationwide scope of effect.” Further, in actual application, the only legal obligations imposed by the Proposed FIP is limited to Texas and Texas generators; there are no substantive burdens imposed on Oklahoma or its generations sources, so practically, the rule is limited solely to Texas. EPA attempts to claim that “[its] interpretation of [its] regulations is applicable to all states, not just Texas and Oklahoma.”⁷⁸ By this logic, any SIP rulemaking would be of nationwide scope, because all SIP approvals and disapprovals require interpretation. This is clearly contradictory to the purpose of Section 307(b)(1)⁷⁹ and if proven true, would effectively read the judicial review provisions out of the CAA.

X. Conclusion

For the reasons discussed above, EPA should withdraw its proposed disapproval of Texas' regional haze SIP and its proposed FIP, and should instead approve Texas' submission in full. Texas' SIP meets all statutory and regulatory requirements and must be approved. Should EPA nonetheless proceed with its proposal, GCLC requests that EPA establish a sufficiently delayed effective date for the final rule and its compliance timelines to allow judicial vetting of EPA's novel legal theory that it can compel such extraordinary actions from a class of Texas operators who are BART-compliant, BART-exempt, or both. The irreparable harm that will befall operators and the State of Texas as result of EPA's proposal demands such forbearance.

GCLC appreciates EPA's consideration of its comments on EPA's Proposed FIP. If you have any questions or concerns, please contact me at 512-236-2000 or mnasi@jw.com.

Respectfully,



Michael J. Nasi
Counsel for the Gulf Coast Lignite Coalition

Cc: See Attached List

Gulf Coast Lignite Coalition

American Electric Power
Luminant
Major Oak Power, LLC
San Miguel Electric Cooperative, Inc.
The North American Coal Corporation

⁷⁸ Proposed FIP, 79 Fed. Reg. at 74888.

⁷⁹ 42 USC §7607(b)(1).



April 20, 2015

U.S. Environmental Protection Agency
 Attention: Docket ID No. EPA-R06-OAR-2014-0754
 Mr. Guy Donaldson
 Chief Air Planning Section (6PD-L)
 1445 Ross Avenue, Suite 1200
 Dallas, TX 75202-2733

Re: Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility, Proposed Rule, Docket ID No. EPA-R06-OAR-2014-0754, FRL-9920-11-Region-6

Dear Mr. Donaldson:

The American Chemistry Council, American Coalition for Clean Coal Electricity, American Coke and Coal Chemicals Institute, American Forest & Paper Association, American Fuel & Petrochemical Manufacturers, American Iron and Steel Institute, American Petroleum Institute, American Wood Council, Brick Industry Association, Council of Industrial Boiler Owners, Electricity Consumers Resource Council, Independent Petroleum Association of America, Industrial Energy Consumers of America, International Liquid Terminals Association, National Association of Manufacturers, National Lime Association, National Mining Association, National Oilseed Processors Association, Portland Cement Association, Texas

Cotton Ginners' Association, The Aluminum Association, and the U.S. Chamber of Commerce (collectively, "the Associations")¹ appreciate the opportunity to submit the following comments in response to the Environmental Protection Agency's ("EPA's") proposed Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility, Proposed Rule, Docket ID No. EPA-R06-OAR-2014-0754, FRL-9920-11-Region-6 (hereinafter, "proposal" or "proposed rule").

INTRODUCTION

The Associations represent the nation's leading energy and manufacturing sectors that form the backbone of the nation's industrial ability to grow our economy and provide jobs in an environmentally sustainable and energy efficient manner. Significantly, the Associations both represent and are reliant upon electric utilities like those directly impacted by EPA's proposal as well as other, large stationary sources which may be regulated under the Clean Air Act's regional haze program. EPA, in this proposal, seeks to dramatically increase its own authority over the regional haze program at the expense of the States and Tribes to whom Congress gave a primary role in implementing the regional haze program. The Associations are key and necessary stakeholders in any regulation that directly impacts energy providers and which may impact manufacturers directly or indirectly in the future.

For the reasons described below, EPA's proposal to disapprove of Texas' and Oklahoma's State Implementation Plans ("SIPs") and impose Federal Implementation Plans ("FIPs") in their place far exceeds EPA's legal authority under the Clean Air Act and would fundamentally transform the structure of the regional haze program from a State-driven program based on cooperative federalism to a centralized, federal program with little real input from States or regulated entities. Nothing in the Clean Air Act or the administrative record supports EPA's determination to supersede the States' judgment in mandating \$2 billion in new emission controls that will have no perceptible impact on visibility. If finalized, EPA's proposal could create dangerous precedent that could be used by EPA in the future to disregard the decisions made by other States under the regional haze program, impose requirements found nowhere in the Clean Air Act or EPA's own regulations, and require States and industry to undertake significant and costly regulatory burdens disproportionate to any visibility benefit.

In recognition of diminished visibility at national parks and other scenic areas, Congress enacted the Clean Air Act's regional haze provisions with a long-term goal of returning these areas to a state of natural visibility. At the same time, however, Congress realized such changes could not be fully realized immediately and adopted an approach by which States would make

¹ A description of each Association is included in Appendix A.

incremental improvements over time. Texas and Oklahoma have invested significant time and resources to understand the sources of regional haze related to their States, the effect of existing federal and State programs to reduce emissions from such sources, and to cooperate with each other and other nearby States to improve visibility. These efforts have been successful, and measured improvements in visibility conditions at the Big Bend, Guadalupe Mountain, and Wichita Mountain Class I areas have exceeded the proposed reasonable progress goals EPA would set for these three areas.

Despite the fact that real-world, measured air quality demonstrates that the States are on track to meet the visibility improvements contemplated by Congress and EPA, EPA has unreasonably proposed to disapprove their SIPs and impose FIPs in their place. The FIPs would impose emission control requirements on a handful of sources in Texas at significant cost, based on counterfactual projections that regional haze will somehow get worse, notwithstanding expected further emissions reductions from levels that have achieved the desired target today. And even then, EPA projects that these costly emissions controls would achieve only *de minimis* visibility improvements in 2018 that would not be perceptible to the human eye and, under EPA's own standards, would round to *zero*.

EPA's proposal, which, in essence, second guesses the reasoned decisions made by Oklahoma and Texas in their SIPs, is both unlawful and flatly inconsistent with EPA's prior administration of the regional haze program where it has routinely approved SIPs that were functionally equivalent to those of Texas and Oklahoma without subjecting them to the same level of scrutiny. The Clean Air Act gives States primacy in implementing the regional haze program and limits EPA's review of regional haze SIPs to an analysis of whether or not the State has complied with statutory and regulatory requirements. Despite the fact that Texas and Oklahoma followed all applicable regulatory requirements for developing regional haze SIPs, EPA here proposes unlawfully to second-guess the States' decisions and to substitute its own judgment for that of the States. EPA compounds this error by applying an unlawful methodology that focuses on emission controls at individual sources rather than source categories and that places undue reliance on visibility benefits to the detriment of the statutory factors mandated by Congress.

EPA's proposal stands in stark contrast to EPA's prior interpretation of the Clean Air Act and its own regional haze regulations, both in guidance and in its review of prior SIP submissions from other States. If finalized, EPA's new interpretation would dramatically expand EPA's authority while unfairly minimizing the role of the States in determining how to best balance competing interests while improving visibility at national parks. As the Supreme Court recently explained, an agency must "provide more substantial justification when its new policy rests upon factual findings that contradict those which underlay its prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account." *Perez v.*

Mortgage Bankers Ass'n, Case No. 13-1041 (S. Ct. Mar. 9, 2015), *Slip op.* at 13 (internal citation omitted).

Here, EPA has failed entirely to address its change in interpretation, let alone provide “substantial justification” for it. Not only would EPA’s approach needlessly impose nearly \$2 billion in unnecessary costs on Texas utilities despite Texas’ reliance on EPA’s prior policy when preparing its SIP, it would create harmful precedent that could be used by EPA in the future to ignore States’ reasoned judgments and impose significant and excessive costs on the Associations’ members. Therefore, we urge EPA to withdraw the proposal and to recognize the reasoned judgment of Texas and Oklahoma by fully approving their regional haze SIPs.

BACKGROUND

A. The Clean Air Act’s Regional Haze Program.

Regional haze “is impairment of visual range or coloration caused by emissions of air pollution produced by numerous sources and activities, located across a broad regional area.” 77 Fed. Reg. 30,248, 30,249 (May 22, 2012). Congress first adopted regional haze provisions in 1977 to address haze issues in national parks and other federal “Class I areas” by adding Section 169A to the Clean Air Act. *See* 42 U.S.C. § 7491. That provision requires EPA to “promulgate regulations to assure ... reasonable progress toward meeting the national goal” of visibility. 42 U.S.C. § 7491(a)(4). EPA has established three primary components for a State’s regional haze SIP: (1) reasonable progress goals (“RPGs”) for Class I areas in the State; (2) a long-term strategy; and (3) implementation of “best available retrofit technology” (“BART”) for certain stationary sources.

Reasonable Progress. The Clean Air Act requires States to submit SIPs that contain “emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal.” 42 U.S.C. § 7491(b)(2). Significantly, the reasonable progress goal “is a goal and not a mandatory standard which must be achieved by a particular date as is the case with the NAAQS.” 64 Fed. Reg. 35,714, 35,733 (July 1, 1999). Further, States have considerable discretion in establishing goals because the Clean Air Act “requires only that a state establish reasonable progress, not the most reasonable progress.” *North Dakota v. EPA*, 730 F.3d 750, 768 (8th Cir. 2013).

States are required to evaluate four statutory factors when establishing reasonable progress goals for Class I areas. 42 U.S.C. § 7491(g)(1); 40 C.F.R. § 51.308(d)(1)(i)(A). These factors are: (1) “costs of compliance;” (2) “the time necessary for compliance;” (3) “the energy and nonair quality environmental impacts of compliance;” and (4) “the remaining useful life of any potentially affected sources.” 42 U.S.C. § 7491(g)(1). EPA has explained that “[i]n this context we believe that the cost of compliance factor can be interpreted to encompass the cost of compliance for individual sources or source categories[.]” EPA, *Guidance for Setting*

Reasonable Progress Goals Under the Regional Haze Program, at 5-1 (June 1, 2007) (emphasis added); see also EPA, *Additional Regional Haze Questions*, at 9 (Sept. 26, 2009) (“Reasonable progress is not required to be demonstrated on a source-by-source basis.”). Visibility improvements associated with emission control measures are *not* included as a mandatory statutory or regulatory factor for determining reasonable progress.

Furthermore, reasonable progress goals are “interim goals that represent incremental visibility improvement over time.” EPA *Reasonable Progress Guidance* at 1-2. The “first planning period” which Texas and Oklahoma address in their SIPs extends from 2008 to 2018. States are required to submit revisions to their SIPs in ten-year intervals. 40 C.F.R. § 51.308(f). During each ten-year planning period, States “must evaluate and reassess all of the elements required [by EPA’s regional haze regulations] taking into account improvements in monitoring data collection and analysis techniques, control technologies, and other relevant factors.” 40 C.F.R. § 51.308(f).

Long Term Strategy. In addition to the reasonable progress goals, States are required to develop long-term strategies to address visibility impairment for all Class I areas “which may be affected by emissions from the State.” 40 C.F.R. § 51.308(d)(3). Long-term strategies must “include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.” *Id.*

EPA regulations require that each State “consult with the other State(s) in order to develop coordinated emission management strategies.” *Id.* § 51.308(d)(3)(i). Under EPA regulations, “[i]f the State has participated in a regional planning process, the State must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process.” 40 C.F.R. § 51.308(d)(3)(ii). In preparing a long-term strategy a State must also evaluate seven specific factors, which differ from the four statutory reasonable progress factors.²

Best Available Retrofit Technology. To comply with the BART requirement, States must develop “emission limitations representing BART” for a discrete set of major stationary sources. 42 U.S.C. § 7491(b)(2)(A); 40 C.F.R. § 51.308(e). State BART determinations must address five statutory factors: (1) “the costs of compliance;” (2) “the energy and nonair quality environmental impacts of compliance;” (3) “any existing pollution control technology in use at the source;” (4) “the remaining useful life of the source;” and (5) “the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.” 42 U.S.C. § 7491(g)(2); see 40 C.F.R. § 51.308(e)(1)(ii)(A). Thus, the BART analysis differs

² These factors include “[e]missions limitations and schedules for compliance to achieve the reasonable progress goal,” mitigation of construction activities, source retirement and replacement, smoke management techniques, and net changes in visibility projected from changes in point, area, and mobile sources. *Id.* § 51.308(d)(3)(v).

significantly from reasonable progress determinations because visibility improvement is included as a fifth statutory factor.

As an alternative to source-specific BART determinations, EPA's regulations provide that a State that participates in a specified regional trading program may rely on those obligations instead of requiring "sources subject to BART to install, operate, and maintain BART." 40 C.F.R. § 51.308(c)(2); *see also* 70 Fed. Reg. 39,104, 39,138-43 (July 6, 2005). EPA has determined that both the Clean Air Interstate Rule ("CAIR") and its replacement Cross State Air Pollution Rule ("CSAPR"), which limit SO₂ and NO_x emissions from power plants, qualify as BART alternatives for States subject to those programs. 70 Fed. Reg. 39,104 (July 6, 2005); 77 Fed. Reg. 33,642 (June 7, 2012).

B. EPA's Disapproval of The Texas and Oklahoma Regional Haze SIPs.

At issue here are regional haze SIPs submitted by Texas and Oklahoma concerning three Class I areas: Big Bend and the Guadalupe Mountains in Texas and the Wichita Mountains in Oklahoma. As contemplated by EPA's regulations, Texas and Oklahoma engaged in extensive consultation regarding Texas' contributions to regional haze in the Wichita Mountains through the Central Regional Air Planning Association ("CENRAP"). CENRAP is one of five regional planning organizations organized and funded by EPA for the purpose of assisting States with the technical aspects of their regional haze SIPs. 2009 Texas SIP Narrative at 3-1. Texas, Oklahoma and the other CENRAP States worked collaboratively to develop common data and modeling for their SIPs. *See, e.g.*, 79 Fed. Reg. at 74,833, 74,855. Oklahoma ultimately concurred with Texas that additional reductions beyond those being contemplated by Texas were not necessary for Oklahoma to meet the reasonable progress goals it had set for the Wichita Mountains. *Letter from Eddie Terrill, Air Quality Division Director, ODEQ, to Susana M. Hildebrand, Air Quality Division Director, TCEQ* at 1 (May 12, 2008).

Notwithstanding the extensive analysis undertaken by Texas and Oklahoma in partnership with CENRAP, EPA proposes here to disapprove both States' SIPs. Specifically, EPA proposes to disapprove most of the Texas submittal, including Texas' reasonable progress goals for Big Bend and the Guadalupe Mountains and Texas' long-term strategy. Further, notwithstanding Oklahoma's agreement that additional reductions beyond those already being contemplated by Texas were not necessary for Oklahoma to meet the reasonable progress goals that it had set for the Wichita Mountains, EPA also proposes to "simultaneously" disapprove of Texas and Oklahoma's consultation and disapprove Oklahoma's reasonable progress goal for the Wichita Mountains.

The fundamental basis for EPA's proposed SIP disapprovals is an "additional analysis" of a "small number of sources" in Texas. 79 Fed. Reg. at 74,839. EPA's analysis models a small subset of selected Texas "sources individually," 79 Fed. Reg. at 74,839, 74,841, "to identify those with the largest potential to impact visibility," EPA, *FIP Technical Support*

Document at A-1. EPA started its “additional analysis” by identifying 38 individual Texas facilities to determine if emission controls on those sources “would yield visibility benefits worth considering for reasonable progress analysis.” 79 Fed. Reg. at 74,877. EPA then employed a multi-step “cost-benefit” methodology and ultimately determined that additional controls at 15 Texas-based sources would achieve cost-effective visibility benefits at the three relevant Class I areas. *See id.* at 74,882-85.

EPA further relies on its “additional analysis” to develop proposed FIPs that “quantify” new reasonable progress goals for the three Class I areas and set specific SO₂ emissions limits for the 15 Texas sources identified in the “additional analysis.” *Id.* Generally speaking, EPA proposes SO₂ emission limits based on upgrades for units already equipped with scrubbers and installation of new flue gas desulfurization (“FGD”) systems for units that have not installed scrubbers. *Id.* at 74,884-85. EPA would require the sources with existing scrubber systems to meet their new limits by 2018, while sources installing new wet scrubbers would be required to meet their new limits by 2020. *Id.* at 74,891 (proposed 40 C.F.R. § 52.2284(d)(2)). EPA acknowledges that the new FGD systems cannot be installed during the current planning period, which ends in 2018. EPA, *FIP Technical Support Document* at 7.

In aggregate, the required emission controls would cost nearly \$2 billion. *See* 79 Fed. Reg. at 74,876-77. Based on EPA’s projections, however, these costs would not actually provide any material improvement in visibility during the interim planning period that the FIP is intended to address. EPA projects that its proposal would, in 2018, improve visibility by 0.03 deciviews at Big Bend, by 0.04 deciviews at the Guadalupe Mountains, and by 0.14 deciviews at the Wichita Mountains. 79 Fed. Reg. at 74,887. This “improvement” would be imperceptible to the human eye, which cannot detect change of less than 1.0 deciview. 77 Fed. Reg. at 30,250. Importantly, actual real-world monitoring data show that Big Bend, the Guadalupe Mountains, and the Wichita Mountains have *already achieved* the 2018 visibility targets that EPA has determined are reasonable. 79 Fed. Reg. at 74,843, 74,870.

COMMENTS

I. EPA’s Proposal Unlawfully Ignores State Primacy In Developing Regional Haze Plans.

EPA’s proposal to disapprove Texas and Oklahoma’s regional haze SIPs is unlawful because it disregards the primary role given to States in implementing the regional haze program. The Clean Air Act is built on principles of cooperative federalism that require EPA to defer to States in developing implementation plans so long as necessary statutory requirements are met. EPA’s proposal ignores those limits and would impose FIPs that ignore the primary implementation role given to Texas and Oklahoma. Not only is this approach inconsistent with the Clean Air Act and EPA’s past practice, it would give EPA unprecedented power arbitrarily to

substitute its own judgment for that of the States at virtually any stage of the implementation process.

As courts have recognized, the Clean Air Act was intended by Congress to be “a model of cooperative federalism.” *Sierra Club v. Korleski*, 681 F.3d 342, 343 (6th Cir. 2012); *see also Michigan v. EPA*, 268 F.3d 1075, 1083 (D.C. Cir. 2001); *Florida Power & Light Co. v. Costle*, 650 F.2d 579, 581 (5th Cir. 1981). Under this structure, Congress specifically found that “air pollution prevention ... is the primary responsibility of States and local governments.” 42 U.S.C. § 7401(a)(3). Relying on that finding, the Eighth Circuit recently noted that “the [Clean Air Act] grants states the primary role in determining the appropriate pollution controls within their borders.” *North Dakota*, 730 F.3d at 760-61. Within that context, “states have broad authority to determine the methods and particular control strategies they will use to achieve the statutory requirements.” *BCCA Appeal Group v. EPA*, 355 F.3d 817, 822 (5th Cir. 2003).

In contrast, after it has established broad emission standards, EPA’s role is limited to ensuring that the States’ implementation of those standards is consistent with the Act. *See Florida Power & Light*, 650 F.2d at 587 (“The great flexibility accorded the states under the Clean Air Act is ... illustrated by the sharply contrasting, narrow role to be played by EPA.”). In that narrow role, EPA is confined to “the ministerial function of reviewing SIPs for consistency with the Act’s requirements.” *Luminant Generation Company LLC v. U.S. EPA*, 675 F.3d 917, 921 (5th Cir. 2012). In other words, EPA cannot second-guess the States, but must approve any SIP that complies with basic statutory requirements. *See* 42 U.S.C. § 7410(k)(3) (“The Administrator *shall* approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this chapter.”) (emphasis added). When, as here, an agency is given a mandatory command (*e.g.*, “shall”) to base its decision on a limited set of factors prescribed by statute, it cannot depart from Congress’ direction by considering additional factors not listed in the statute. *See National Ass’n of Home Builders v. Defenders of Wildlife*, 551 U.S. 644 (2007) (rejecting interpretation of Clean Water Act that would have allowed EPA to deny transfer of permitting authority to State agencies based on additional factors when the statute stated that EPA “shall approve” transfer where “nine specified criteria are satisfied”).

EPA has previously recognized its limited role in implementing the regional haze program and explained that “[t]he final regional haze rule ... provide[s] States considerable discretion in establishing reasonable progress goals for improving visibility in Class I areas.” EPA, *Response to Petition for Reconsideration of Regional Haze Rule 11* (Jan. 10, 2001). Thus, rather than establishing strict implementation requirements, EPA’s rule “requires States to determine the rate of progress for remedying existing impairment that is reasonable, taking into consideration the statutory factors, and the informed input from all stakeholders.” 64 Fed. Reg. at 35,731; *see also* 40 C.F.R. § 51.308(d)(1)(i)(A). In its guidance to States, EPA further emphasized that the regional haze rule “gives States wide latitude to determine additional control

requirements” and, in applying the required statutory factors, the States “have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant.” EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 4-2, 5-1 (June 1, 2007). Thus, EPA has explained that “[a]s long as this evaluation is done adequately and the States provide a reasoned basis for their decision, EPA will defer to the state” with respect to reasonable progress determinations. 77 Fed. Reg. 40,150, 40,156 (July 6, 2012).

In this proposal, however, EPA ignores these well-established principles of cooperative federalism, disregards the reasoned judgment of Texas and Oklahoma, and seeks to impose a radically different implementation plan based on its own independent analysis. This is contrary to the Clean Air Act and unlawful. In the absence of any showing that Texas and Oklahoma failed to comply with the statutory and regulatory requirements for developing reasonable progress goals and long term strategies, EPA has no choice under the Clean Air Act but to approve these SIPs.

First, Texas fully complied with all statutory and regulatory requirements in developing its own reasonable progress goals for the Big Bend and Guadalupe Mountain Class I areas. Specifically, Texas appropriately considered the four statutory factors in 42 U.S.C. § 7479(g)(1) and established reasonable progress goals after determining that the uniform rate of progress was not reasonably achievable by 2018. EPA does not dispute that Texas’ evaluation complied with the statutory and regulatory requirements. EPA agrees that Texas’ reasonable progress goals provide for “improvement in visibility for the most impaired days during the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period” in accordance with 40 C.F.R. § 51.3108(d)(1). 79 Fed. Reg. at 74,834. EPA also agrees with Texas that the reasonable progress goals based on the uniform rate of progress are not achievable due to international emissions. *Id.* at 74,843, 87. Thus, because Texas has complied with these criteria, EPA has a mandatory duty to approve the SIP pursuant to 42 U.S.C. § 7410(k)(3). See *National Ass’n of Home Builders*, 551 U.S. 644 (EPA has no discretion when statutory language says the agency “shall approve” a State program if statutory criteria are met). Nevertheless, EPA arbitrarily proposes to second-guess Texas’ 2018 reasonable progress goals by replacing them with goals that would improve projected visibility at the Big Bend and Guadalupe Mountain Class I areas by an imperceptible few hundredths of a deciview, but require enormous expenditures by a handful of stationary sources.

EPA’s proposal is contrary to the cooperative federalism principles on which the regional haze program is based. Under those principles, EPA must respect the State’s choices and approve its reasonable progress goals as long as the State performed the required analysis. EPA does not claim that Texas failed to perform the required analysis. Instead, it faults “how [Texas] analyzed and weighed the four reasonable progress factors.” EPA, *Texas Technical Support Document* 18. But, under the Clean Air Act, EPA must approve a State’s reasonable progress

goals, even if EPA would have weighed the statutory factors differently and reached a different result. See, *North Dakota*, 730 F.3d at 768 (“[T]he CAA requires only that a state establish reasonable progress, not the most reasonable progress.”); see also *Alaska Department of Environmental Conservation v. EPA*, 540 U.S. 461, 490 (2004) (recognizing that, when EPA reviews the reasonableness of state best available control technology determinations, it must act with deference and cannot “second guess state decisions”). Thus, it is unlawful and contrary to Congress’ intent for EPA to disapprove of Texas’ reasonable progress goals simply because EPA, after second-guessing Texas’ analysis, concluded that additional reductions from a handful of additional sources are feasible. See also Section II, *infra*.

Second, Oklahoma and Texas fully complied with EPA’s consultation requirements for cross-State emissions through participation in a regional planning process. Based on encouragement from EPA, Texas and Oklahoma worked with nearby States to establish CENRAP to assist the States with technical issues associated with their regional haze SIPs. In particular, CENRAP assisted the States in developing emissions inventories and modeling, including models for a 2002 base case for visibility in Class I areas, projections for 2018 emissions and visibility, estimates of natural conditions, and cost/benefit analyses for emission controls. Through the CENRAP process and subsequent consultation meetings with Oklahoma, Texas shared significant amounts of information with Oklahoma regarding SO₂ and NO_x emissions from Texas that could affect Class I areas in Oklahoma. Texas also responded to several requests from Oklahoma and agreed to make changes to its New Source Review program to ensure that potential visibility impacts in Oklahoma were accounted for. At the conclusion of the consultation period, Texas requested “Oklahoma’s concurrence on this assessment and verification that [Oklahoma] is not depending on any additional reductions from Texas sources in order to meet [Oklahoma’s] reasonable progress goals.” *Letter from Susanna M. Hildebrand, Air Quality Director, TCEQ, to Eddie Terrill, Air Quality Division Director, ODEQ 2* (Mar. 25, 2008). Oklahoma agreed with Texas’ assessment and did not request further reductions from Texas beyond those expected from existing programs agreed to or implemented by Texas. See *Letter from Eddie Terrill to Susanna Hildebrand, supra*. As a result, Oklahoma established reasonable progress goals that did not require additional emissions controls from Texas facilities, and Texas developed a long-term strategy that did not incorporate additional emissions controls to improve visibility in Oklahoma.

Despite the depth of coordination and consultation between Oklahoma and Texas, EPA’s proposal ignores the reasoned conclusions that these States reached and rejects Oklahoma’s reasonable progress goals and Texas’ long-term strategy because, in EPA’s separate and distinct judgment, Oklahoma should have sought additional information about potential emissions controls from certain sources in Texas. By second-guessing these States, EPA’s proposal is unlawful, arbitrary and capricious. EPA does not dispute the quality of Oklahoma’s modeling or its analysis of the four statutory factors required by 40 U.S.C. §7419(g)(1). Instead, it relies on what it considers to be “an incomplete consultation with Texas.” EPA, *Oklahoma Technical*

Support Document at 11. This conclusion is not supported by the record. EPA points to no flaws in the CENRAP regional planning process in which Texas and Oklahoma participated together. Nor does it point to any specific flaws in the subsequent consultation process between the States. In fact, EPA concedes that, as a result of consultations between the States, Oklahoma “had (1) abundant information showing the impact of Texas sources on visibility at the Wichita Mountains [and] (2) evidence that cost-effective controls on these sources were likely available.” 79 Fed. Reg. 74,867. EPA goes on to acknowledge that “the analysis developed by CENRAP [and used by Texas and Oklahoma in their consultations] provide[d] a great deal of information on contributions to visibility impairment and a set of potential add-on controls and costs associated with those controls.” *Id.* at 74,872.

Although the proposal acknowledges the wealth of information shared between the two States, EPA nonetheless asserts that Texas somehow deprived Oklahoma of relevant information about Texas sources and emission reduction options. In doing so, EPA fails to identify any specific information that Texas failed to provide. Instead, EPA simply reinterprets the data and modeling available to Oklahoma while it developed its SIP and reaches a different conclusion—that Oklahoma’s reasonable progress goals should require additional emission controls from a handful of Texas sources in order to provide small, imperceptible improvements to visibility in Class I areas in Oklahoma. In doing so, EPA clearly would exceed its statutory authority by putting aside a review of Oklahoma’s compliance with statutory and regulatory requirements and instead substituting its own judgment for that of the State. Not only is this an unlawful usurpation of Oklahoma’s discretion under the regional haze program to consider the four statutory factors and establish reasonable progress goals, it is also arbitrary, capricious, and unsupported by the record in light of the expansive consultation and information sharing process that took place between Texas and Oklahoma.

After proposing to disapprove Oklahoma’s reasonable progress goals, EPA goes on to propose disapproval of Texas’ long-term strategy on the basis that it is not consistent with the modified reasonable progress goals that EPA would impose through a FIP. This is both inconsistent with the Clean Air Act and EPA’s implementing regulations and patently unreasonable. Texas’ long-term strategy fully complies with the Clean Air Act and EPA’s regulations because it meets Texas’ obligations with respect to Oklahoma and all other States whose visibility may be impacted by emissions from Texas sources. Under EPA regulations, to satisfy the long-term strategy requirement, a State that “has participated in a regional planning process . . . must ensure that it has included all measures needed to achieve its apportionment of emissions reduction obligations *agreed upon* through that process.” 40 C.F.R. § 51.308(d)(3)(ii) (emphasis added). Texas did so here. EPA concedes that “Oklahoma did not specifically request any additional reductions from Texas sources,” 79 Fed. Reg. at 74,856, meaning that the “agreement” between Texas and Oklahoma did not require any new emissions controls to be added to Texas’ long-term strategy. Instead, EPA ignores this agreement between the States and proposes to disapprove Texas’ long-term strategy because it is not consistent with the additional

emission reductions proposed by EPA in its Oklahoma FIP. This conclusion is flatly inconsistent with EPA regulations, which require consistency with reasonable progress goals “established by states” during the SIP process, not with alternative reasonable progress goals developed at a later date by EPA. 40 C.F.R. § 51.308(d)(3)(ii).

EPA simply ignores the relevant provision of Section 51.308(d)(3)(ii) and instead bases its proposed disapproval on a supposed “interpretation” of a different portion of that rule, which provides that a State’s SIP must “include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas.” 40 C.F.R. § 51.308(d)(3). Engrafting a requirement nowhere found in the text of the regulation, EPA now proposes to “interpret” the phrase “progress goal” to instead mean a reasonable progress goal that is “approved or approvable” by EPA. 79 Fed. Reg. at 74,829. But no amount of supposed “*Auer* deference” permits EPA to “interpret” a regulation to impose a requirement that is contrary to the regulation itself. EPA simply ignores the fact that the “progress goals” phrase it cites refers to the sentence that precedes it: “the reasonable progress goals established by States having mandatory Class I Federal areas.” 40 C.F.R. § 51.308(d)(3).

Moreover, EPA’s proposed disapproval is unreasonable. Texas’ obligation to develop a long-term strategy must be based on the agreements reached among the States at the time their SIPs are submitted. Texas—and other States—cannot be expected to divine whether EPA will disagree with another State’s reasonable progress goals years in the future and then anticipate and preemptively incorporate into its long-term strategy the revised reasonable progress goals EPA may decide to include in a subsequent FIP. Thus, even if EPA were to disapprove a State’s reasonable progress goals, it is not reasonable to demand that neighboring States adjust their long-term strategies until the next review period.³

By going beyond its limited authority under the Clean Air Act strictly to review States’ compliance with applicable statutory and regulatory requirements in establishing reasonable progress goals and long-term strategies, EPA would fundamentally transform the regional haze program into a federal program over which State decisions could be vetoed for virtually any reason by EPA. Given the nature of regional haze issues, States spend significant resources modeling and tracking emissions from a wide variety of sources and consulting with neighboring States prior to developing SIPs to address regional haze. Those efforts will be largely futile if EPA can later substitute its own judgment for that of a State’s decision by conducting what is in essence a *de novo* review of a State’s reasonable progress goals and long-term strategy. Such an approach deprives States of any certainty in implementing the regional haze program and is in

³ EPA has previously agreed with this position, explaining that when a State’s final action with respect to reasonable progress goals “deviate[s] from what was included in the [regional] modeling,” the remedy is for affected States to “consider asking [the contributing state] for additional emission reductions” “during subsequent period progress reports and regional haze SIP revisions.” 77 Fed. Reg. at 41,155-56.

direct contradiction to the cooperative federalism principles upon which the regional haze program was based. If EPA proceeds to disapprove of Texas and Oklahoma's SIPs, it will set a dangerous precedent that will threaten the primacy of all States to use their judgment to establish reasonable progress goals and long-term strategies that will improve visibility over time while respecting other State interests that are recognized by the Clean Air Act.

II. EPA's Proposed Individual Source-Based Approach For Reasonable Progress Goals Is Unlawful.

EPA's proposal to disapprove Texas' reasonable progress goals and long-term strategy and replace them with a FIP is also unlawful because EPA adopts an individual source-based approach to setting reasonable progress goals inconsistent with the Clean Air Act. Unlike other aspects of the regional haze program, reasonable progress goal provisions are intended to address contributions from a wide range of sources that can be best addressed on a source-category basis. In this respect, they are fundamentally different from other provisions such as those for BART and reasonably attributable visibility impairment ("RAVI"), which are specifically designed to address individual sources. Moreover, EPA's adoption of an individual source-based approach is inconsistent with EPA's past practice and with EPA's strict uniformity rule for regional offices.

In the proposal, EPA rejects Texas' source category-based approach for establishing reasonable progress goals in favor of an approach that focuses on potential emissions controls for individual sources. In particular, EPA asserts that "TCEQ's analysis is insufficient to determine the visibility benefit of controlling the source or subset of sources with the most effective controls for improving visibility conditions." 79 Fed. Reg. at 74,841; *see also id.* at 74,838 ("[B]ecause TCEQ did not evaluate controls on a source-by-source basis, source-specific factors related to the evaluation of the reasonable progress four factor analysis could not be considered."). EPA then determined it was "necessary to conduct an additional analysis" because "individual sources were not considered by the TCEQ." *Id.* at 74,839. After conducting an individual source and individual emission control analysis of a small subset of sources within Texas, EPA concluded that several sources should be required to install additional control technologies. Not only does this approach ignore State primacy in establishing reasonable progress goals, it unlawfully shifts the focus of the reasonable progress goals from source categories to individual sources.

First, the Clean Air Act and EPA's implementing regulations draw a clear line between source category-based reasonable progress goals and other source-specific regional haze provisions. As the Tenth Circuit recently explained, "[n]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress." *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014). Instead, the Clean Air Act discusses "classes or categories of sources" that "may reasonably be anticipated to cause or contribute significantly to impairment of visibility" and directs EPA to promulgate rules to address them. 42 U.S.C. § 7491(a)(3), (b)(1). In contrast, under the Clean Air Act, BART and

RAVI provisions are applied individually to “each major stationary source” meeting certain threshold criteria. *Id.* § 7491(b)(2)(A), (c).

This structural distinction is maintained in EPA’s regulations. For example, under the Regional Haze Rule, SIPs that incorporate reasonable progress goals are intended to address “regional haze.” 40 C.F.R. § 51.308(d). Regional haze is defined by EPA as “visibility impairment that is caused by the emission of air pollutants *from numerous sources over a wide geographic area.*” *Id.* § 51.301 (emphasis added). In contrast, EPA defines BART as an “emission limitation [that] must be applied on a case-by-case basis” *Id.* Likewise, EPA explains that its RAVI provisions are designed to address “visibility impairment that is caused by the emission of air pollutants from one or a small number of sources.” *Id.* Thus, EPA’s regulations draw a stark distinction between reasonable progress goals on the one hand, which address emissions from a broad range of sources, and BART and RAVI provisions, which address individual sources.

EPA’s own guidance also confirms this interpretation of both the Clean Air Act and EPA’s implementing regulations. In defining the reasonableness of controls, EPA expressly contrasts reasonable progress goals with BART:

Unlike the technical demonstration for CAIR or BART, the reasonable progress demonstration involves a test of a strategy. The strategy includes a suite of controls that has been identified through the identification of pollutants and source categories of pollutants for visibility impairment—the possible controls for these pollutants (and their precursors) and source categories—the application of four statutory factors and how much progress is made with a potential strategy with respect to the glide path. Modeling occurs with a strategy and is not a source-specific demonstration like the BART assessment.

EPA, *Additional Regional Haze Questions* 9 (Sept. 27, 2006). EPA goes on to explain more explicitly that “*Reasonable progress is not required to be demonstrated on a source-by-source basis.*” It is demonstrated based on a control strategy developed from a suite of controls that has been assessed with the four statutory factors and the uniform rate of progress.” *Id.* (emphasis added). In describing its own obligations with respect to establishing reasonable progress goals in FIPs, EPA explained that it has “flexibility to make technical judgments within the bounds of the [regional haze] rule and ... *is not statutorily obligated to impose source-specific controls.*” 77 Fed. Reg. at 40,164 (emphasis added). When establishing a FIP, “EPA steps into the State’s shoes,” *id.*, and EPA cannot disapprove a SIP—as it proposes to do here—for failing to conduct an analysis that EPA concedes is not statutorily required. *See* 42 U.S.C. § 7410(k)(3) (“The Administrator *shall* approve [a SIP or SIP revision] as a whole if it meets all of the applicable requirements of this chapter.”); *National Ass’n of Home Builders*, 551 U.S. at 664 (finding similar language forbids EPA from denying approval on the basis of non-statutory factors).

Second, EPA fails to provide a reasoned explanation for disapproving Texas' reasonable progress goals based on Texas' failure to conduct a source-by-source analysis of emission controls when EPA has never required an individual source-based approach in the past. In its prior reviews of State reasonable progress goals EPA has uniformly approved States' reliance on source category-based analyses, even in the face of public comments urging a source-based approach. For example, EPA approved Alaska's regional haze SIP in which the State asserted that "it is reasonable to conduct the four-factor analysis on the general source categories rather than on individual sources." Alaska, *SIP Narrative* 9-9 (2011); 78 Fed. Reg. 10,546 (Feb. 14, 2013) (approving Alaska SIP). Likewise, EPA approved Oregon's reasonable progress goals after the State explained that it "looked at key pollutants and certain source categories and the magnitude of their emission in applying the four factors." Oregon, *SIP Narrative* 163 (2011); 77 Fed. Reg. 50,611 (Aug. 22, 2012) (approving Oregon SIP). EPA also approved Washington's reasonable progress goals after the "state decided to focus its four-factor analyses on ... 10 specific industries and emission source categories." Washington, *SIP Narrative* at 9-5 to 9-7 (2010); 79 Fed. Reg. 33,439 (June 11, 2014) (approving Washington SIP).

It is a well-established tenet of administrative law that "[r]easoned decision making ... necessarily requires the agency to acknowledge and provide an adequate explanation for its departure from established precedent." *Dillmon v. NTSB*, 588 F.3d 1085, 1089-90 (D.C. Cir. 2009) (citing *FCC v. Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1811 (2009)). Indeed, given that the submitting States relied upon EPA's established guidance and precedents in crafting their SIPs, EPA is required to provide a "more substantial justification" for its disapprovals. *Perez v. Mortgage Bankers Ass'n*, *supra*, *slip op.* at 13. In its proposal to disapprove Texas' reasonable progress goals, EPA fails to even acknowledge, let alone provide a reasoned explanation for, its departure from past precedent where it has approved multiple SIPs based on analyses that were, in all relevant respects, identical to that conducted by Texas.

Third, by applying a wholly different standard in its evaluation of Texas' reasonable progress goals, EPA is violating its strict uniformity rule. EPA regulations state that "[e]ach responsible official in a Regional Office, including the Regional Administrator, shall assure that actions taken under the act: (1) Are carried out fairly and in a manner that is consistent with the Act and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices" 40 C.F.R. § 56.5(a). This regulation reflects an agency-wide commitment to uniformity in interpreting and applying the Clean Air Act, and agency actions that violate these regulations are "contrary to law." See *National Environmental Development Association's Clean Air Project v. EPA*, 752 F.3d 999 (D.C. Cir. 2014). In this proposal, EPA unlawfully applies a wholly different standard of review to Texas' reasonable progress goals than it has in prior reviews of reasonable progress goals submitted by other States that have likewise relied on source category-based analyses. To satisfy its own uniformity rule, EPA must treat Texas like any other State and approve its use of a source category-based analysis in setting reasonable progress goals.

Fourth, EPA's individual source-based approach unlawfully creates inconsistent treatment of sources by subjecting them to different standards under BART and reasonable progress SIPs. Several of the sources that EPA evaluates and targets for additional emission controls are BART-eligible sources. Because Texas is currently subject to CSAPR, BART-eligible sources can be controlled through Texas' implementation of that rule because EPA has concluded that CSAPR's emission limits on those sources are more stringent than BART. 77 Fed. Reg. 33,642, 33,648 (June 7, 2012). Further, by definition, CSAPR "will achieve greater reasonable progress than would have resulted from the installation and operation of BART." 40 C.F.R. § 51.3108(e)(2). As a result, Texas' compliance with CSAPR should be sufficient to meet reasonable progress goals with respect to BART-eligible sources. EPA's proposal to require separate and additional controls for BART-eligible sources on a source-by-source basis is fundamentally incompatible with EPA's BART and CSAPR regulations and further underscores the fact that reasonable progress goals should not be developed in an individual source-specific manner.

III. EPA's Reliance On Visibility Benefits In Evaluating Reasonable Progress Goals Is Unlawful.

EPA's proposal is also unlawful because it would require States to include visibility benefits as a mandatory, if not preeminent, factor in setting reasonable progress goals. Under the Clean Air Act, States are required to consider four factors in setting reasonable progress goals: "the costs of compliance, the time necessary for compliance, the energy and nonair quality environmental impacts of compliance, and the remaining useful life of any existing source subject to such requirements." 42 U.S.C. § 7491(g)(1). Visibility benefits are not included among the statutory factors. As EPA has previously explained, "[t]he final regional haze rule clearly provides States with the flexibility to establish a reasonable progress goal *based on its analysis of the statutory factors*." EPA, *Response to Petition for Reconsideration of Regional Haze Rule 13* (Jan. 10, 2001). Federal land managers have concurred in this conclusion and have urged EPA not to include visibility impacts as a mandatory fifth factor in State reasonable progress goals because EPA has no "clear statutory mandate to do so." See U.S. Forest Service, *Recommendations for Improved Implementation of the Regional Haze Program 5* (May 2014). In this respect, the State's obligations to establish reasonable progress goals are substantially different than those for BART, where visibility benefits play an important role. See 42 U.S.C. § 7491(g)(2) (including "the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology" as a mandatory factor in BART determinations). This difference reflects a clear Congressional intent that States cannot be compelled to include visibility benefits in determining reasonable progress goals and certainly cannot be compelled to consider them in the manner that EPA would require in this proposal.

Nevertheless, EPA proposes to disapprove Texas' reasonable progress goals based on a failure to consider visibility benefits alongside the required statutory factors. See, e.g., 79 Fed.

Reg. at 74,839 (asserting that Texas should have “separately evaluate[d] the visibility benefit from implementation of [emission] control[s]”); *id.* at 74,838 (asserting that “individual benefits were masked by the inclusion of those controls with little visibility benefit that only served to increase the total cost figure”). Simply put, visibility benefits are not mandatory statutory factors that States are compelled to consider when establishing reasonable progress goals. As a result, it is unlawful for EPA to disapprove a State’s reasonable progress goals based on a failure to evaluate visibility benefits.

EPA’s FIP proposal exacerbates the unlawful nature of EPA’s action by elevating visibility benefits above the four statutory factors. In applying its individual source-based approach, EPA relies on visibility benefits as a threshold test to determine which individual sources it will review for costs—a statutorily required factor. An approach that focuses first on visibility benefits will unnecessarily constrain States’ ability to use their discretion to apply the four statutory factors and establish reasonable progress goals as intended by Congress. In fact, even in the context of BART determinations, where visibility benefits must be considered, courts have rejected EPA’s attempts to elevate visibility above the other statutory factors. *See American Corn Growers Ass’n v. EPA*, 291 F.3d 1, 6-7 (D.C. Cir. 2002) (“The Haze Rule’s splitting of the statutory factors is consistent with neither the text nor the structure of the statute.”). There the court found that EPA’s regulation was unlawful because it “isolate[d] [the visibility] benefit calculation and constrain[ed] authority Congress conferred on the states.” *Id.* at 8-9.

EPA’s undue reliance on visibility benefits in its proposed disapproval of Texas’ reasonable progress goals and proposed FIP is unlawful and raises serious concerns regarding the implementation of reasonable progress goals. By elevating visibility benefits to a primary, threshold role in establishing reasonable progress goals, EPA would distort the statutory analysis envisioned by Congress and, contrary to cooperative federalism principles, would unnecessarily constrain States’ ability to use their discretion to consider the four reasonable progress factors that are mandated by Congress. Moreover, if EPA is permitted to disapprove of State reasonable progress goals on the basis of this non-statutory factor, States and regulated entities would face the risk of becoming subject to significant—and potentially disproportionate—emission control costs if EPA perceives that such emission controls would confer some miniscule visibility benefit.

IV. The Costs of EPA’s Proposal Are Extreme And Unjustified.

EPA’s proposed FIP for Texas is also arbitrary and capricious because the costs of the emissions controls that EPA would require are excessive in comparison to the minimal visibility benefits that they would provide. In evaluating the costs of the proposed emission control requirements, EPA disregards its own guidance and appears to apply only a cost per ton methodology that fails to account for important differences in the emissions that impair visibility as well as the role that location and other facility-specific factors can play in determining the

effect that emissions controls will have on visibility in the Class I areas that are the focus of the regional haze provisions. As a result, EPA singles out a handful of sources that would be required to spend billions of dollars to install emissions controls that would result, at most, in miniscule improvements in visibility in Class I areas that would be imperceptible to observers.

Unlike generally applicable emissions standards that are designed to improve air quality everywhere, the regional haze provisions are focused specifically on a limited number of Class I areas throughout the country. As a result, not all emissions reductions will have the same impacts on visibility in Class I areas. Key factors such as the type of pollutant at issue, distance from Class I areas, and prevailing winds can all affect the degree to which certain emissions will contribute to visibility impairment and, as a result, the visibility benefits that will be produced by reducing those emissions. In other words, not every ton of emissions reductions is the same. Recognizing this fact, EPA explains in guidance that “in assessing emission reduction strategies for source categories or individual, large scale sources, simple cost effectiveness estimates based on a dollar-per-ton calculation may not be as meaningful as a dollar-per-deciview calculation, especially if the strategies reduce different groups of pollutants.” EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 5-2 (June 1, 2007). EPA has reaffirmed that view in subsequent SIP reviews, stating its belief “that dollars per deciview is one of several metrics that can be used to analyze cost of visibility improvement.” 77 Fed. Reg. 40,150, 40,156 (July 6, 2012). That is, because of distance, wind patterns and other relevant meteorological factors, even emissions that might be quite inexpensive to reduce may have no meaningful impact on downwind visibility.

In the proposal, however, EPA fails to apply its own guidance in evaluating the cost effectiveness of its proposed FIP. While EPA provides an evaluation of dollars per ton of emissions reduction, 79 Fed. Reg. at 74,876-77, T. 32, it makes no effort to connect those costs to actual visibility benefits. Instead, EPA simply asserts, without providing a detailed cost/benefit comparison, that emissions controls at individual units are “cost effective” and that visibility benefits are “significant.” See EPA, *FIP Technical Support Document* at 31. In fact, while EPA separately evaluates the cost of the proposed FIP and the visibility benefits, it never compares them directly in an attempt to evaluate the cost effectiveness of the proposed controls. See generally EPA, *FIP Technical Support Document*; EPA, *Cost Technical Support Document*. Instead, EPA asserts that the Unfunded Mandates Reform Act, which requires a written cost benefit analysis, does not apply. 79 Fed. Reg. at 74,889-90. By failing to include the relevant cost benefit analysis in the record, it is impossible to verify EPA’s assertion that in preparing the FIP, “the cost of controls [were] weighted against their projected visibility benefits at a number of Class I areas.” EPA, *FIP Technical Support Document* at 11.

Had EPA conducted a proper dollars per deciview cost benefit analysis, it would be readily apparent that the emission controls in the proposed FIP are not cost effective. In total, EPA projects that installing the proposed emission controls at six facilities would cost

approximately \$1.8 billion. *See* 79 Fed. Reg. at 74,876-77, T32. However, the effect of those emission controls on nearby Class I areas would be imperceptible to the human eye. In fact, in 2018 the visibility conditions would improve at Big Bend from 16.6 to 16.57 deciviews and at Guadalupe Mountains from 16.3 to 16.26 deciviews. *See id.* at 74,887. In other words, EPA proposes to impose enormous costs to improve visibility by a few hundredths of a deciview. Even by EPA's own metrics these costs are excessive in comparison to the benefits. Indeed, the human eye cannot detect changes in visibility of less than one deciview and, under EPA's own statistical standards, these 2018 "improvements" would be treated as nonexistent.⁴ That is why, in another FIP proposal, EPA recently concluded that a similar incremental visibility improvement was minimal and could not justify the much smaller difference in cost between wet and dry SO₂ scrubbers. EPA, *Arkansas FIP Proposal, Prepublication Version* 160-61 (Mar. 6, 2015). Imposition of such massive costs without achieving any cognizable visibility benefit during the interim planning period cannot be considered cost effective. Thus, in light of the statutory obligation to consider the costs of compliance, 42 U.S.C. § 7491(g)(1), EPA's proposed FIP is unreasonable, arbitrary, and capricious.

V. EPA Lacks Authority To Include Emission Controls That Cannot Be Implemented During The Regional Haze Planning Period.

The proposed FIP also exceeds EPA's legal authority under the regional haze program because it would require individual sources to install new emission control devices in 2020, after the 10-year regional haze planning period has concluded. Under EPA's regional haze rule, States must prepare SIPs that adopt control strategies over an initial implementation period from 2008 to 2018 and must then conduct "a comprehensive reassessment and revision of those strategies, as appropriate, every 10 years thereafter." 77 Fed. Reg. at 30,252. EPA recognizes the limited scope of the SIP in the preamble, noting that the proposal "addresses regional haze for the first planning period from 2008 through 2018." 79 Fed. Reg. at 74,818.

Focusing exclusively on emissions controls that can be implemented during the interim 2008 to 2018 planning period is consistent with both the reasonable progress goals and long-term strategy components of the States' regional haze plans. For example, EPA guidance directs States to focus on emissions controls at sources that "could be controlled within the strategy period" when "setting the RPG and ... establishing the SIP requirements to meet the RPG." EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 5-2 (June 1, 2007). In evaluating SIPs submitted by other States, EPA has further explained that "[i]n setting the RPGs, states must also consider the rate of progress needed to reach natural visibility conditions by 2064 ... and the emissions reduction measures needed to achieve that rate of progress over the 10-year period of the SIP." 76 Fed. Reg. 16,168, 16173 (Mar. 22, 2011)

⁴ U.S. EPA., Technical Support Document for Demonstration of the Transport Rule as a BART Alternative 24, n.24 (Dec. 2011), Docket ID No. EPA-HQ-OAR-2011-0729-0014 ("All differences that are < 0.05 [deciviews] were rounded down to 0.0 and are considered to be no degradation").

(proposed approval of Oklahoma Uniform Rate of Progress) (emphasis added). Likewise, EPA has previously explained that “[t]he [long term strategy] is the compilation of all control measures a state will use *during the implementation period of the specific SIP submittal* to meet applicable RPGs.” 77 Fed. Reg. at 30,251 (emphasis added).

Despite recognizing these limits on the scope of SIPs under the interim planning period, EPA proposes a FIP that would require emission controls that cannot be implemented until at least 2020. See FIP TSD at 7 (acknowledging that “typical SO₂ scrubbers take up to five years to plan, construct, and bring to operational readiness”). In fact, EPA acknowledges that it “cannot assume that the SO₂ controls we are proposing will be installed and operational within this planning period, which ends in 2018.” *Id.* In this respect EPA’s proposal is inconsistent with past regional haze actions, where EPA has consistently limited the scope of FIPs to control measures that can be implemented during the interim planning period. See, e.g., 77 Fed. Reg. 20,894, 20,944 (Apr. 6, 2012) (applying a July 31, 2018, compliance deadline in North Dakota FIP); 77 Fed. Reg. 57,864, 57,916 (Sept. 18, 2012) (applying a July 31, 2018, compliance deadline in Montana FIP); 79 Fed. Reg. 52,420, 52,426 (Sept. 3, 2014) (applying a December 31, 2018, compliance deadline in Arizona FIP).

EPA’s proposal to require installation of emission controls in 2020 exceeds EPA’s authority under the Clean Air Act and is, therefore, unlawful for at least two independent reasons. First, EPA’s proposed FIP ignores the statutory mandate to consider the “time necessary for compliance” as a factor in determining reasonable progress. 42 U.S.C. § 7491(g)(1). Because the time necessary for compliance will extend into the next planning period, beginning in 2018, EPA is obligated by statute to defer consideration of such emission controls until the next planning period. Further, by proposing emission controls that cannot be implemented until 2020, EPA’s proposed FIP would unlawfully extend beyond the scope of Texas’ required SIP submission. Under the Clean Air Act, the scope of EPA’s FIP authority is limited to preparing “a plan (or portion thereof)” that “fill[s] all or a portion of a gap or otherwise correct[s] all or a portion of an inadequacy in a State implementation plan.” 42 U.S.C. § 7602(y). Yet, Texas was under no obligation under the Clean Air Act or Regional Haze Rule to develop a SIP that extended beyond 2018. Because the scope of Texas’ SIP obligation was limited to achieving reasonable progress during the interim 2008 to 2018 planning period, EPA’s FIP authority is necessarily subject to the same limits. Thus, determination of whether additional emission controls are needed after 2018 must, by statute, be deferred until the next planning period.

CONCLUSION

For the reasons stated above, EPA's proposal to disapprove Texas and Oklahoma's SIPs and impose FIPs to establish reasonable progress goals and long-term strategies is unlawful, arbitrary, and capricious. The Associations urge EPA to approve Texas and Oklahoma's SIPs as consistent with the Clean Air Act and EPA's Regional Haze Rule.

The undersigned Associations appreciate the opportunity to comment on this proposal.

American Chemistry Council

**American Coalition for Clean Coal
Electricity**

**American Coke and Coal Chemicals
Institute**

American Forest & Paper Association

**American Fuel & Petrochemical
Manufacturers**

American Iron and Steel Institute

American Petroleum Institute

American Wood Council

Brick Industry Association

Council of Industrial Boiler Owners

Electricity Consumers Resource Council

**Independent Petroleum Association of
America**

Industrial Energy Consumers of America

**International Liquid Terminals
Association**

National Association of Manufacturers

National Lime Association

National Mining Association

National Oilseed Processors Association

Portland Cement Association

Texas Cotton Ginners' Association

The Aluminum Association

U.S. Chamber of Commerce

Appendix A

The **American Chemistry Council** (“ACC”) represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is an \$812 billion enterprise and a key element of the nation's economy.

The **American Coalition for Clean Coal Electricity** (“ACCCE”) is a partnership of companies involved in producing electricity from coal. Coal, an abundant and affordable American energy resource, plays a critical role in meeting our country's growing need for affordable and reliable electricity. ACCCE recognizes the inextricable linkage between energy, the economy and our environment. Toward that end, ACCCE supports policies that promote the use of coal, one of America's largest domestically produced energy resources, to ensure a reliable and affordable supply of electricity to meet our nation's growing demand for energy.

The **American Coke and Coal Chemicals Institute** (“ACCCI”), which was founded in 1944, is the international trade association that represents 100% of the U.S. producers of metallurgical coke used for iron and steelmaking, and 100% of the nation's producers of coal chemicals, who combined have operations in 12 states. It also represents chemical processors, metallurgical coal producers, coal and coke sales agents, and suppliers of equipment, goods and services to the industry.

The **American Forest & Paper Association** (“AF&PA”) is the national trade association of the paper and wood products industry, which accounts for approximately 4 percent of the total U.S. manufacturing gross domestic product. The industry makes products essential for everyday life from renewable and recyclable resources, producing about \$210 billion in products annually and employing nearly 900,000 men and women with an annual payroll of approximately \$50 billion.

The **American Fuel & Petrochemical Manufacturers** (“AFPM”) (formerly known as NPRA, the National Petrochemical & Refiners Association) is a national trade association whose members comprise more than 400 companies, including virtually all United States refiners and petrochemical manufacturers. AFPM's members supply consumers with a wide variety of products and services that are used daily in homes and businesses.

The **American Iron and Steel Institute** (“AISI”) serves as the voice of the North American steel industry and represents member companies accounting for over three quarters of U.S. steelmaking capacity with facilities located in 43 states.

The **American Petroleum Institute** (“API”) represents over 590 oil and natural gas companies, leaders of a technology-driven industry that supplies most of America's energy, supports more than 9.8 million jobs and 8 percent of the U.S. economy, and, since 2000, has invested nearly \$2 trillion in U.S. capital projects to advance all forms of energy, including alternatives.

The **American Wood Council** (“AWC”) is the voice of North American traditional and engineered wood products, representing over 75% of the industry. From a renewable resource that absorbs and sequesters carbon, the wood products industry makes products that are essential to everyday life and employs approximately 400,000 men and women in family-wage jobs.

The **Brick Industry Association** (“BIA”), founded in 1934, is the recognized national authority on clay brick manufacturing and construction, representing approximately 250 manufacturers, distributors, and suppliers that historically provide jobs for 200,000 Americans in 45 states.

The **Council of Industrial Boiler Owners** (“CIBO”) is a trade association of industrial boiler owners, architect-engineers, related equipment manufacturers, and University affiliates representing 20 major industrial sectors. CIBO members have facilities in every region of the country and a representative distribution of almost every type of boiler and fuel combination currently in operation. CIBO was formed in 1978 to promote the exchange of information about issues affecting industrial boilers, including energy and environmental equipment, technology, operations, policies, laws and regulations.

The **Electricity Consumers Resource Council** (“ELCON”) is the national association representing large industrial consumers of electricity. ELCON member companies produce a wide range of industrial commodities and consumer goods from virtually every segment of the manufacturing community. ELCON members operate hundreds of major facilities in all regions of the United States. Many ELCON members also cogenerate electricity as a by-product to serving a manufacturing steam requirement.

The **Independent Petroleum Association of America** (“IPAA”) serves as an informed voice for the exploration and production segment of America’s oil and natural gas industry. IPAA represents the thousands of independent oil and natural gas producers and service companies across the United States. Independent producers develop 95 percent of domestic oil and gas wells, produce 54 percent of domestic oil and produce 85 percent of domestic natural gas.

The **Industrial Energy Consumers of America** (“IECA”) is a nonpartisan association of large energy intensive manufacturing companies with \$1.0 trillion in annual sales, over 2,900 facilities nationwide, and more than 1.4 million employees worldwide. It is an organization created to promote the interests of manufacturing companies through advocacy and collaboration for

which the availability, use and cost of energy, power or feedstock play a significant role in their ability to compete in domestic and world markets. IECA membership represents a diverse set of industries including: chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, glass/ceramic, building products, independent oil refining, and cement.

The **International Liquid Terminals Association** (“ILTA”) is an international trade association that represents 84 commercial operators of aboveground liquid storage terminals serving various modes of bulk transportation, including tank trucks, railcars, pipelines, and marine vessels. Operating in all 50 states, these companies own more than 600 domestic terminal facilities and handle a wide range of liquid commodities, including crude oil, refined petroleum products, chemicals, biofuels, fertilizers, and vegetable oils. Customers who store products at these terminals include oil companies, chemical manufacturers, petroleum refiners, food producers, utilities, airlines and other transportation companies, commodity brokers, government agencies, and military bases. In addition, ILTA includes in its membership nearly 400 companies that are suppliers of products and services to the bulk liquid storage industry.

The **National Association of Manufacturers** (“NAM”) is the largest manufacturing association in the United States, representing small and large manufacturers in every industrial sector and in all 50 states. Manufacturing employs nearly 12 million men and women, contributes more than \$1.8 trillion to the U.S. economy annually, has the largest economic impact of any major sector and accounts for two-thirds of private-sector research and development. The NAM is the powerful voice of the manufacturing community and the leading advocate for a policy agenda that helps manufacturers compete in the global economy and create jobs across the United States.

The **National Lime Association** (“NLA”) is the industry trade association for the manufacturers of high calcium quicklime and dolomitic quicklime (calcium oxide) and hydrated lime (calcium hydroxide), which are collectively and commonly referred to as “lime.” Lime is used in a wide array of critical applications and industries, including for environmental control and protection, metallurgical, construction, chemical and food production. With plant operations located in 24 states, NLA’s members produce greater than 99 percent of the United States’ calcium oxides and hydroxides.

The **National Mining Association** (“NMA”) is a national trade association whose members produce most of America’s coal, metals, and industrial and agricultural minerals. Its membership also includes manufacturers of mining and mineral processing machinery and supplies, transporters, financial and engineering firms, and other businesses involved in the nation’s mining industries. NMA works with Congress and federal and state regulatory officials to provide information and analyses on public policies of concern to its membership, and to promote policies and practices that foster the efficient and environmentally sound development and use of the country’s mineral resources.

The **National Oilseed Processors Association** (“NOPA”) is a national trade association that represents 13 companies engaged in the production of vegetable meals and vegetable oils from oilseeds, including soybeans. NOPA’s member companies process more than 1.6 billion bushels of oilseeds annually at 63 plants in 19 states, including 57 plants which process soybeans.

The **Portland Cement Association** (“PCA”) represents 27 U.S. cement companies operating 82 manufacturing plants in 35 states, with distribution centers in all 50 states, servicing nearly every Congressional district. PCA members account for approximately 80% of domestic cement-making capacity.

Texas Cotton Ginner’s Association (“TCGA”), founded in 1897, is one of the oldest cotton organizations in the United States. TCGA represents a cotton gin membership of over 200 members that process over 95% of the Texas’s cotton crop each year – approximately five million bales of cotton annually. Cotton gins separate the raw agricultural commodity, seed cotton from the farm, into its marketable forms consisting of cotton fiber, which is used by the cotton textile industry and cottonseed, which is used for food and animal feed.

The **Aluminum Association**, based in Arlington, VA, represents U.S. and foreign-based aluminum companies and their suppliers throughout the value chain, from primary production to value added products to recycling. The Association is the industry’s leading voice, providing global standards, business intelligence, sustainability research and industry expertise to member companies, policymakers and the general public.

The **U.S. Chamber of Commerce** (the “Chamber”) is the world’s largest business federation representing the interests of more than 3 million businesses of all sizes, sectors, and regions, as well as state and local chambers and industry associations. The Chamber is dedicated to promoting, protecting, and defending America’s free enterprise system.



View southwest from the end of Wilderness Ridge looking across the mouth of McKittrick Canyon
Credit: National Park Service

COMMENTS OF
LUMINANT GENERATION COMPANY LLC



EPA's Proposed Partial Disapproval of Texas and
Oklahoma Regional Haze State Implementation
Plans and Proposed Federal Implementation Plans

Docket EPA-R06-OAR-2014-0754
79 Federal Register 74,818 (December 16, 2014)

SUBMITTED APRIL 20, 2015

FOREWORD

The Environmental Protection Agency's regional haze proposal for Texas and Oklahoma goes far beyond the agency's authority under the Clean Air Act. There is no legal or technical basis for EPA's proposed federal implementation plan ("FIP") since the state implementation plan ("SIP") submitted by Texas fully complies with the statute and all regulatory standards.

The Clean Air Act's regional haze program is about making reasonable incremental improvements to visibility at national parks and certain other federal areas—it's not about what is purported to be technologically possible or achieving alleged potential health benefits. Here, even though the visibility goals EPA proposes for Texas and Oklahoma are already being met—as evidenced by real-world monitoring data—EPA's proposal would require Texas to spend \$2 billion for what EPA projects would be *no* perceptible improvement in visibility.

EPA should withdraw its proposal and instead fully approve Texas's and Oklahoma's regional haze plans.

The Clean Air Act's regional haze program requires states to work cooperatively to develop state plans that achieve reasonable progress toward the goal of improved visibility in national parks and other federally protected areas (called "Class I areas"). To comply, Texas worked with neighboring states over a multi-year period to model and project haze impacts, review state emissions, and develop coordinated plans to achieve reasonable progress.

Texas and its neighbors, including Oklahoma, consulted on the emission reductions that each would include in its plan to improve visibility in the federal areas in each state. These plans are working. As confirmed by recent monitoring data, Texas and its neighbors have already achieved substantial progress in improving visibility, and, in fact, visibility improvements have surpassed even the most aggressive projections and goals.

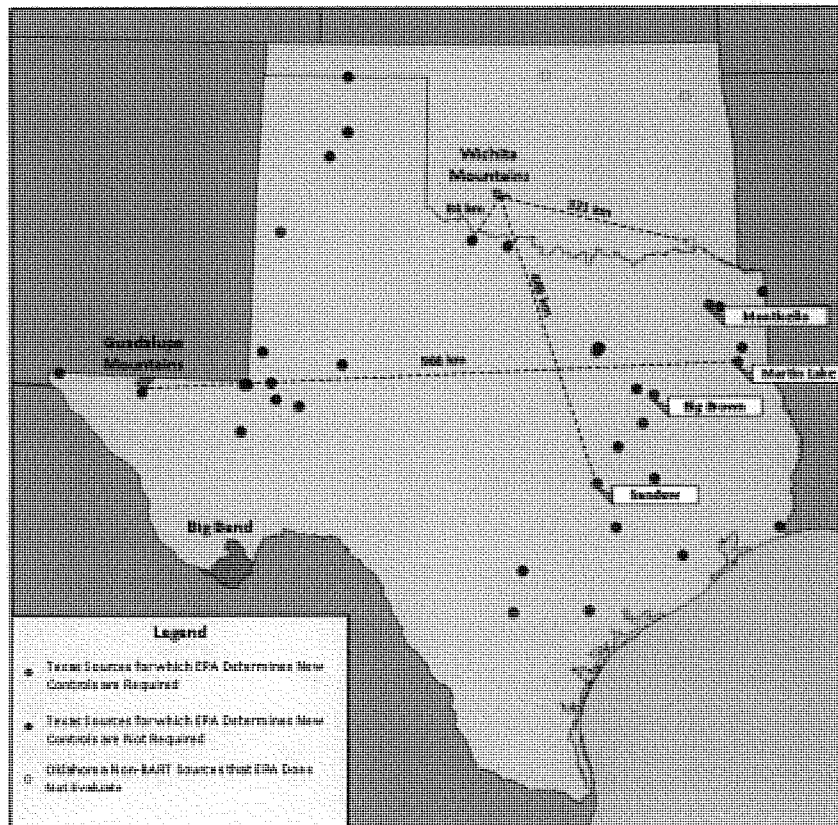
Yet EPA now brushes aside this cooperation among states and disregards the substantial improvements that have been achieved. Instead of using the same objective criteria and standards applied to every other state's regional haze plan, EPA inexplicably created standards out of whole cloth to review the Texas and Oklahoma plans.

The proposal burdens a handful of Texas generating units, located far away from these Class I areas, with massive costs that would threaten their continued operation and economic viability and the thousands of jobs they provide.

To arrive at this conclusion, EPA invents a methodology found nowhere in the statute or regulations and applies it in a seemingly random manner. The map below depicts EPA's skewed and unprecedented approach for Texas, with sources far away from these federal areas somehow being captured by EPA's novel



methodology, while closer sources are excluded. There is no discernible rationale for this flawed approach.



Never before has EPA singled out individual sources using the new approach that EPA employs here to derail the regional haze plans by Texas and Oklahoma. The record is irrefutable that EPA has routinely approved other states' regional haze plans that look just like the Texas plan and achieved the same level of progress.

With this unprecedented approach, EPA resorts to stretching the science and the law beyond all recognition to justify its preordained result. EPA fails to follow its own modeling protocols or to validate its modeling, and it uses results well outside the model's well-recognized limitations.

Further, EPA's legal analysis ignores the criteria that Congress included in the statute and relies

instead on criteria that Congress did not include. Ignoring its own regulations, EPA offers newly minted “interpretations” that bear no resemblance to the plain language of the regulations themselves. Tellingly, EPA’s proposal begins not by offering a plausible reading of its regulations, but by explaining why it thinks this new approach to Texas is beyond the review of a federal court. This is the opposite of reasoned decision-making.

Perhaps the most glaring problem with EPA’s alternative is that it would produce no perceptible changes in visibility beyond what Texas’s plan achieves in this planning period, but at a cost of approximately \$2 billion more. The vast majority of these costs, EPA concedes, are for measures that cannot even be implemented by the interim goal of 2018 and are thus outside the agency’s authority to impose in the first place.

The regional haze program is not a health-based program that requires emission reductions at any cost and on any schedule conceived by EPA, but instead is a program designed to achieve reasonable incremental improvements in visibility at specific areas over a long-term horizon. Yet EPA’s replacement proposal for Texas would not achieve any noticeable visibility improvements in the three Class I areas in Texas and Oklahoma.

Visibility is measured in deciviews. Anything less than one deciview generally can’t be perceived by the human eye. As the table below shows, EPA’s alternative would, under EPA’s own estimate, result in imperceptible changes in visibility measured in tenths and hundredths of a deciview.

EPA’S PROPOSAL ACHIEVES NO DISCERNABLE IMPROVEMENT

Class I Area	State Established Goal (2018) (20% worst days)	EPA Proposed Goal (2018) (20% worst days)	Difference Between State Goal and EPA Proposed Goal
Big Bend (TX)	16.60 dv	16.57 dv	0.03 dv
Guadalupe Mountains (TX)	16.30 dv	16.26 dv	0.04 dv
Wichita Mountains (OK)	21.47 dv	21.33 dv	0.14 dv

In other words, EPA would force **\$2 billion** in costs on a few Texas companies in hopes of achieving imperceptible improvements in visibility.

Although no one will discern the difference from EPA’s proposal, every person in Texas will be exposed to increased costs of electricity and risks to reliability. There is no form of cost-benefit analysis that could justify such an approach, and, unsurprisingly, EPA does not even try to offer one.

None of this debate is necessary. The Texas regional haze SIP has been in place since 2009, and it is working. Texas emissions have decreased, and visibility has improved—beyond what even EPA would require in this proposal. Based on data from EPA's own visibility monitors at these three Class I areas, visibility has *already* improved to levels *better than* EPA asserts is necessary by 2018.

The table below shows actual monitored visibility at these areas, compared to the goal that EPA claims must be achieved by 2018.

EPA'S OWN MONITORS SHOW REASONABLE PROGRESS HAS ALREADY BEEN ACHIEVED

Class I Area	Actual Observed Conditions from EPA's IMPROVE Monitors (2009-13) (5-year average) ¹	EPA's Proposed Goal (2018)
Big Bend (TX)	16.3	16.57
Guadalupe Mountains (OK)	15.3	16.26
Wichita Mountains (OK)	21.2	21.33

While EPA relies on computer modeling, actual real-world data clearly and irrefutably demonstrate the effectiveness of the Texas plan. These improvements are the result of on-going emission reductions that will continue under Texas rules and national programs like the Cross-State Air Pollution Rule (CSAPR) and the Mercury and Air Toxics Standard (MATS)—all without the additional \$2 billion that EPA would require.

EPA ignores these data from its own monitors and even refuses to account for CSAPR and MATS limitations in the modeling it uses to justify its proposal. But the reality remains the same—Texas's plan is working and visibility is improving. EPA should withdraw its FIP and approve the Texas SIP.

¹ 79 Fed. Reg. 74,818, 74,843, 74,870 (Dec. 16, 2014).

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency's ("EPA") proposal to disapprove portions of Texas's and Oklahoma's state implementation plans ("SIPs") that address regional haze, and to replace them with federal implementation plans ("FIPs") that target a small group of Texas facilities, is unlawful and must be withdrawn. On every level, EPA's proposal exceeds the agency's authority under the Clean Air Act and EPA's regional haze regulations. As explained in detail in these comments, EPA's proposal suffers from many fatal legal and technical flaws, including:

1. **EPA Ignores State Primacy.** EPA's proposal disregards the primary role and substantial flexibility that states are given by Congress in the Clean Air Act to determine what is "reasonable progress" toward the national goal of improved visibility. Texas's and Oklahoma's SIPs were developed cooperatively in accordance with the statutory factors and regulatory requirements, and EPA must approve them.
2. **EPA Is Applying an Unlawful Standard to Texas.** EPA proposes to disapprove Texas's regional haze SIP and impose a FIP for the sole reason that, in EPA's view, Texas was required to conduct a source-specific analysis of certain facilities to meet the reasonable progress requirement.² But, as the Tenth Circuit has recently held: "Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress."³ And EPA's own regional haze guidance provides that "[r]easonable progress is not required to be demonstrated on a source-by-source basis."⁴ EPA's proposal thus relies on the wrong legal standard and is contrary to law.
3. **EPA's Methodology Is Contrary to the Clean Air Act.** EPA's proposal is further contrary to law because it attempts to impose a non-statutory factor on Texas. EPA's proposal is not based on an analysis of the four statutory factors for "reasonable progress," but instead hinges on a non-statutory factor—"visibility benefit"—to determine whether additional emission reductions should be required and which sources must incur the costs. Federal Land Managers have recently warned EPA against using "visibility benefit" as "a fifth factor" since EPA has no "statutory mandate to do so."⁵ Nevertheless, EPA treats this non-statutory factor as the primary consideration in its analysis here. Thus, "EPA [has] overstepped the bounds of its narrow statutory role in the SIP approval process"

² 79 Fed. Reg. 74,818, 74,839 (Dec. 16, 2014) (explaining that EPA is proposing to disapprove Texas's SIP "[b]ecause individual sources were not considered by the TCEQ").

³ See *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014).

⁴ EPA, *Additional Regional Haze Questions* 9 (Sept. 27, 2006), available at <http://tinyurl.com/EPARHquestions>.

⁵ USDA Forest Serv., *Recommendations for Improved Implementation of the Regional Haze Program* 5 (May 2014), available at <http://tinyurl.com/FederalLandrec>.

and acted “ultra vires” by relying on a “factor[] which Congress has not intended [the EPA] to consider.”⁶

4. EPA Invents New Requirements for Texas Sources. EPA has stated that its new “individual source” and “visibility benefit” approach for Texas is “without . . . prior precedent”⁷ and treats Texas and Oklahoma different than all other states. EPA’s proposal thus violates principles of administrative law and EPA’s own regulations, which require EPA to treat states and regulated entities in a similar and fair fashion.⁸
5. EPA Arbitrarily Disapproves the Consultation between Oklahoma and Texas. The regulations require that Texas’s long-term strategy reflect the emission reductions requested and agreed to by the other Central Regional Air Planning Association (“CENRAP”) states. Texas fully met this obligation with respect to Oklahoma through a cooperative and mutually agreeable process. EPA’s unlawful disapproval of that consultation would be the first time in history it has disapproved a state regional haze consultation.
6. EPA’s Proposal Is Unnecessary and Outside of its Authority Because EPA’s Visibility Goals Have Already Been Achieved. EPA’s proposal flies in the face of current visibility monitoring data from EPA’s IMPROVE monitoring network. Actual data from these monitors show that Big Bend, Guadalupe Mountains, and Wichita Mountains have *already achieved* the 2018 visibility targets that EPA has determined are reasonable—without any further emission reductions or controls on Texas sources. EPA concedes that data from Interagency Monitoring of Protected Visual Environments (“IMPROVE”) monitors is “of highest importance,”⁹ yet EPA fails to account for the more recent, real-world data from these monitors in its flawed modeling and proposed FIPs. Because the reasonable progress goals have already been achieved, EPA has no authority to require further controls from Texas sources.
7. Texas Sources Have Negligible Impacts Under EPA’s Own Thresholds. EPA judges Texas’s SIP using different and more stringent standards than it has used in other states. For example, in two separate actions approving Idaho’s and Oregon’s reasonable progress goals, EPA found that a total deciview impact on a Class I area of 0.5 deciview was “*relatively small*” and that a facility with an

⁶ *Luminant Generation Co. LLC v. EPA*, 675 F.3d 917, 925, 926 (5th Cir. 2012) (internal citations omitted) (internal quotations omitted).

⁷ Declaration of Sam Coleman, *Nat’l Parks Conservation Ass’n v. McCarthy*, No. 11-01548, at 5 (D.D.C. 2014).

⁸ *Nat’l Envtl. Dev. Ass’n’s Clean Air Project v. EPA*, 752 F.3d 999, 1010–11 (D.C. Cir. 2014) (holding that EPA action contrary to its regional consistency regulations was contrary to law); see also 40 C.F.R. § 56.5(a)(2) (requiring that officials in EPA regional offices “shall assure that actions taken under the act . . . [a]re as consistent as reasonably possible with the activities of other Regional Offices” (emphasis added)).

⁹ EPA, *CENRAP Modeling TSD: Review of Modeling and Emission Inventory Development for the Regional Haze Implementation Plan for the State of Texas* 34 (Nov. 2014) (“CENRAP Modeling TSD”).

impact at or below that level should not be required to install additional controls to further reduce its impact.¹⁰ Here, in contrast, EPA has determined that the **largest** impact from any one of Luminant's plants at a Class I area is 0.15 deciviews—less than one-third of what EPA previously found to be “relatively small” and an “unreasonable” basis for regulation—yet it subjects Luminant's plants to drastic and costly emission reductions on this basis.¹¹ EPA's proposal thus violates EPA's regional consistency regulations and is arbitrary and capricious.

8. EPA's Proposal Would Achieve No Detectable Change in Visibility. The overall change in visibility that EPA would mandate in 2018 (which, again, has already been achieved) is miniscule and provides no reasonable basis for EPA's proposed emission controls. The human eye can generally only detect a change of 1.0 deciview or more. Yet, EPA projects that its proposal would, at most, improve visibility in 2018 (the interim date at issue) at Big Bend by 0.03 of a deciview, at Guadalupe Mountains by 0.04 of a deciview, and at Wichita Mountains by 0.14 of a deciview.¹² Not only is this level imperceptible to any visitor at these Class I areas—and well out of proportion to the massive projected costs—the required “improvements” at Big Bend and Guadalupe Mountains round **to zero**, under EPA's own convention of rounding to the nearest tenth of a deciview.
9. EPA Treats Texas Differently Than Every other CSAPR State. Texas electric generating unit (“EGUs”) are subject to stringent SO₂ and NO_x emission limits under EPA's Cross-State Air Pollution Rule (“CSAPR”), and EPA has determined that CSAPR's limits are better at improving visibility in Class I areas than Best Available Retrofit Technology (“BART”). We have found no instance of EPA issuing a FIP for a CSAPR state that would require emission limits beyond what will be required to comply with CSAPR. EPA's proposed FIP thus treats Texas and Texas EGUs in an inconsistent manner than EPA's prior actions in other states and arbitrarily ignores EPA's own CSAPR-better-than-BART findings.
10. The Costs of EPA's Proposal Are Extreme and Unjustified. EPA disregards the law of diminishing returns. The costs that EPA's proposal would impose are staggering and well out of proportion to the imperceptible “visibility benefits” that EPA projects. EPA calculates that its proposed emission limits would require just **four Texas companies** to spend **\$2 billion** for so-called “visibility improvements” that no person will be able to detect.¹³ The vast majority of this cost that

¹⁰ 77 Fed. Reg. 30,248, 30,256 (May 22, 2012) (Idaho); 77 Fed. Reg. 30,454, 30,461, 30,464 (May 23, 2012) (Oregon).

¹¹ EPA_txbart3612k_Vis_2002_2018_PSAT_Projected_072913.xlsx.

¹² 79 Fed. Reg. at 74,887.

¹³ See EPA, *Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan (Cost TSD)* 24-5 (Nov. 2014) (“Cost TSD”) (scrubber retrofit capital costs); *id.* at 55 (scrubber upgrade costs). See also 79 Fed. Reg. at 74,876–77 (same).



EPA projects—over \$1 billion—would be borne by Luminant alone under EPA's proposal. This is patently unreasonable and contrary to any notion of "reasonable progress." EPA's own regional haze guidance says that "a dollar-per-deciview calculation" is the more "meaningful" way to determine reasonable progress,¹⁴ yet, tellingly, EPA refuses to provide that calculation here. In our comments, we provide the dollar-per-deciview values that EPA failed to provide, and they demonstrate that EPA's proposal goes well past the point of efficient and reasonable improvements in visibility and is substantially more costly than measures that EPA has found to be not required in other states for reasonable progress.

11. **EPA's Proposal Exceeds Its Regulatory Authority.** EPA has no legal authority to require the installation of scrubbers at Luminant's units in 2020 as part of its proposed FIP. Per EPA's regulations, the Texas SIP submission at issue—which was submitted by the Texas Commission on Environmental Quality ("TCEQ") to EPA in 2009—covers only the first regional haze planning period (2008-2018) and addresses emission reductions needed to meet the 2018 interim goal. EPA concedes that the scrubbers it is proposing would take at least five years to construct and thus cannot be operational by 2018.¹⁵ EPA's proposal thus clearly runs afoul of the statutory factors for reasonable progress—which require consideration of "the time necessary for compliance"¹⁶—and exceeds EPA's FIP authority, which is only to fill the gaps in a SIP, not to add regulation outside the required scope of the SIP submission.¹⁷ Whether these units must install controls to meet subsequent goals for later years is a matter fundamentally to be decided by Texas in the **second** planning period, not by EPA in the current period.

For these reasons, and the many additional reasons discussed in these comments, EPA should withdraw its current proposal and instead fully approve the remaining portions of the Texas and Oklahoma regional haze SIPs.

¹⁴ EPA, *Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program* 5-2 (June 1, 2007) ("EPA Reasonable Progress Guidance"), available at <http://tinyurl.com/EPARPguidance>.

¹⁵ EPA, *Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plan (FIP TSD)* 7 (Nov. 2014) ("FIP TSD").

¹⁶ 42 U.S.C. § 7491 (g)(1).

¹⁷ *Id.* § 7602(y).

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Luminant's full comments are available at the link and QR code below:

<http://www.energyfutureholdings.com/wp-content/uploads/2015/04/LuminantRegionalHazeEPAComments.pdf>





Impacts of Environmental Regulations in the ERCOT Region

Executive Summary

The Electric Reliability Council of Texas (ERCOT) is the independent system operator (ISO) for the ERCOT Interconnection, which encompasses approximately 90% of electric load in Texas. ERCOT is the independent organization established by the Texas Legislature to be responsible for the reliable planning and operation of the electric grid for the ERCOT Interconnection. Under the North American Electric Reliability Corporation (NERC) reliability construct, ERCOT is designated as the Reliability Coordinator, the Balancing Authority, and as a Transmission Operator for the ERCOT region. ERCOT is also registered for several other functions, including the Planning Authority function.

There are several proposed or recently finalized U.S. Environmental Protection Agency (EPA) regulations that could have an impact on grid reliability in ERCOT. These rules include the Mercury and Air Toxics Standards (MATS), the Cross-State Air Pollution Rule (CSAPR), the Regional Haze program, the Cooling Water Intake Structures rule, the Steam Electric Effluent Limitation Guidelines (ELG) rule, the Coal Combustion Residuals (CCR) Disposal rule, and the Clean Power Plan. This study assesses the individual and cumulative impact of these regulations on generation resources in the ERCOT region, and potential implications for grid reliability.

Resource owners in ERCOT will need to take actions to comply with these regulations in the coming years, or else retire or mothball the units. Table ES-1 and Table ES-2 show the potential compliance requirements for coal and natural gas units, respectively, under these regulations.

Table ES-1: Compliance Requirements for Coal Units

Regulation	Compliance Date	Compliance Requirements	Potential Compliance Actions	Potential Compliance Costs
Mercury and Air Toxics Standards	April 2015 (April 2016 with extension)	Sets emissions limits for acid gases, toxic metals, and particulate matter	Install control technology retrofits (e.g., dry sorbent injection)	\$10/kW; \$0.75/MWh (based on generator survey responses)
Cross-State Air Pollution Rule	January 2015	Cap and trade program for NO _x and SO ₂ emissions	Procure allowances to cover air emissions of NO _x and SO ₂	\$0.75-\$7.25/MWh (based on ERCOT modeled allowance prices)
Regional Haze Program	Three to five years after final Federal Plan issued*	Sets SO ₂ emissions limits for specific coal-fired units in the ERCOT region	Install or upgrade scrubbers	\$450-\$573/kW (based on previous ERCOT study)
316(b) Cooling Water Intake Structures Rule	2018-2022, on each unit's permit renewal cycle	Requires controls for units with once-through cooling	Install or upgrade modified traveling screens and fish return systems	\$5-\$25/kW; \$0.10-\$0.50/MWh (based on EPA cost analysis and consultation with Black & Veatch)
Steam Electric Effluent Limitation Guidelines	Three years after publication of final rule*	Sets limits for toxic metal concentrations in wastewater	Upgrade wastewater treatment processes to meet limits	\$10-\$60/kW; \$0.40-\$1.40/MWh (based on EPA cost analysis)
Coal Combustion Residuals Disposal Rule	Five years after publication of final rule*	Requirements for future and existing (Subtitle C only) disposal	Groundwater monitoring, liner requirements, liner retrofits (Subtitle C only)	\$50/kW; \$15-\$37.50/ton ash (based on NERC study)
Clean Power Plan	2020-2029 (interim goal); 2030 onwards (final goal)	No specific requirements; EPA assumes heat rate improvements. Likely to result in significant reductions in output from coal units.	Uncertain at this time	Unknown

*Subject to timing of final rule

Table ES-2: Compliance Requirements for Natural Gas Units

Regulation	Compliance Date	Compliance Requirements	Potential Compliance Actions	Potential Compliance Costs
Cross-State Air Pollution Rule	January 2015	Cap and trade program for NO _x and SO ₂ emissions	Procure allowances to cover air emissions of NO _x and SO ₂	\$0.10-\$2.75/MWh (based on ERCOT modeled allowance prices)
316(b) Cooling Water Intake Structures Rule	2018-2022, on each unit's permit renewal cycle	Requires controls for units with once-through cooling	Install or upgrade modified traveling screens and fish return systems	\$5-\$25/kW; \$0.10-\$0.50/MWh (based on EPA cost analysis and generator survey responses)
Clean Power Plan	2020-2029 (interim goal); 2030 onwards (final goal)	No specific requirements; EPA assumes increased utilization of combined cycle units	Uncertain at this time	Unknown

As shown in Table ES-1, coal units are the most affected by environmental regulations. Without considering the Clean Power Plan, 3,000 MW to 8,500 MW of coal-fired capacity in ERCOT can be considered to have a moderate to high risk of retirement – due primarily to the costs of EPA's proposed requirements for the Regional Haze program. The results of this analysis also suggest potential impacts from CSAPR in the short-term. By comparison, the other regulations are not expected to have a significant system-wide impact, but could affect the economics of a small number of units. The implementation and regulatory timeline of the Clean Power Plan will impact decisions resource owners make about whether to retrofit or retire impacted units. Additionally, the Clean Power Plan itself may cause unit retirements, due to the need to meet stringent CO₂ emissions limits on a state-wide basis. ERCOT's modeling analysis suggests that the Clean Power Plan, in combination with the other regulations, will result in the retirement of up to 8,700 MW of coal-fired capacity.

The results of this study indicate that the Regional Haze requirements and the Clean Power Plan will have significant impacts on the planning and operation of the ERCOT grid. Both are likely to result in the retirement of coal-fired capacity in the ERCOT region. Currently, resource owners are required to notify ERCOT no less than 90 days prior to the date that the unit is retired or mothballed. Given the competitiveness of the ERCOT market and the current uncertainty surrounding environmental regulations, it is unlikely that generators would notify ERCOT of potential retirements or unit suspensions before the minimum notification deadline. If ERCOT does not receive early notification of these retirements, and if multiple unit retirements occur within a short timeframe, there could be periods of reduced system-wide resource adequacy and localized transmission reliability issues due to the loss of generation resources in and around major urban centers. Additionally, loss of the reliability services provided by retiring units will strain ERCOT's ability to integrate new intermittent renewable generation resources. The need to maintain operational reliability (i.e., sufficient ramping capability) could require the curtailment of renewable generation resources. This would limit and/or delay the integration of renewable resources, leading to a delay in achieving compliance with the proposed Clean Power Plan limits.

The Clean Power Plan will also result in increased wholesale and consumer energy costs in the ERCOT region. Based on ERCOT's analysis, energy costs for consumers may increase by up to 20% in 2020, without accounting for the associated costs of transmission upgrades, higher natural gas prices caused by increased gas demand, procurement of additional ancillary services, energy efficiency investments, capital costs of new capacity, and other costs associated with the retirement or decreased operation of coal-fired capacity in the ERCOT region. Consideration of these factors would result in even higher energy costs for consumers. Though the other regulations considered in this study will pose costs to owners of generation resources, they are less likely to significantly impact costs for consumers.

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Appendices

Appendix A: Unit Emissions and Control Technologies	
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1. Introduction

This study assesses the potential impacts of several proposed and recently finalized U.S. Environmental Protection Agency (EPA) regulations on grid reliability in the Electric Reliability Council of Texas (ERCOT) region. The analysis considers the impacts of the Mercury and Air Toxics Standards (MATS), the Cross-State Air Pollution Rule (CSAPR), the Regional Haze program, the Cooling Water Intake Structures rule, the Steam Electric Effluent Limitation Guidelines (ELG) rule, the Coal Combustion Residuals (CCR) Disposal rule, and the Clean Power Plan.

ERCOT approaches this analysis from the perspective of an independent system operator in a competitive market that has achieved significant success in using competition to drive efficient outcomes. Existing market policies and investments in transmission in ERCOT have incentivized market participants to maximize the efficiency of the generating fleet and develop new technologies including renewable generation. With recent investments in transmission, more than 11 GW of wind capacity have been successfully integrated into the ERCOT grid. The ERCOT region maintains a forward-looking open market and provides affordable and reliable electricity to consumers in Texas.

ERCOT undertook two parallel efforts for this study. First, in the summer of 2014, ERCOT distributed a survey to fossil fuel-fired generators on the impacts of relevant environmental regulations. The responses indicate the current compliance status of fossil fuel-fired resources in the ERCOT region. Second, ERCOT conducted a modeling analysis of the impacts of CSAPR, the Regional Haze program, and the Clean Power Plan on generation resources and energy costs in the ERCOT region.

The report is organized as follows:

- **Section 1.1** provides an overview of the environmental regulations evaluated in this study;
- **Section 1.2** describes prior ERCOT analyses related to the potential impacts of environmental regulations;
- **Section 2** discusses the requirements and associated costs of environmental regulations for generation resources;
- **Section 3** presents the results of the generator survey;
- **Section 4** describes the methodology and results of ERCOT's modeling analysis;
- **Section 5** discusses the impacts of these regulations for grid reliability in the ERCOT region;
- **Section 6** presents a cost analysis of the relevant environmental regulations; and,
- **Section 7** provides a summary of the conclusions of this study.

1.1. Background on Environmental Regulations

There are several proposed and recently finalized environmental regulations that may impact generation resources in the ERCOT region. In the coming years, generators will need to make decisions about how to comply with these regulations in light of market trends in the power sector and other regulations on the horizon. The cumulative impact of market economics and environmental regulations could affect the economic viability of generation resources and result in capacity retirements. In addition, complying with these regulations in the near-term could lead to concurrent unit outages and increased seasonal mothballing of capacity. If these changes result in impacts to grid reliability and transmission constraints, and there is not sufficient time to mitigate these issues, there could be challenges to ERCOT's management of the grid.

This analysis considers the potential impacts of the MATS rule, CSAPR, the Regional Haze program, the 316(b) rule, the ELG rule, the coal ash disposal rule, and the Clean Power Plan. ERCOT elected to study these regulations because of their potential impacts for generation resources, and their anticipated compliance timeframes within the next several years. These regulations are summarized in Table 1, and discussed in further detail in Section 2.

Table 1: Environmental Regulations Impacting ERCOT Generation

Regulation	Compliance Date	Description	Impacts
Mercury and Air Toxics Standards	April 2015 (April 2016 with extension)	Sets limits on hazardous air pollutant emissions at power plants	Owners of coal units without sufficient controls will need to retrofit to comply
Cross-State Air Pollution Rule	January 2015	Addresses cross-state air pollution through limits on annual nitrogen oxides (NO _x) and sulfur dioxide (SO ₂) emissions, and ozone season (summer) NO _x emissions	Most fossil fuel-fired generators in ERCOT are subject to CSAPR; resource owners may need to purchase allowances to comply
Regional Haze	Three to five years after final Federal Plan issued*	Requires controls on air emissions to improve visibility in national parks	Owners of certain coal units are required to retrofit with scrubbers, or upgrade existing scrubbers
316(b) Cooling Water Intake Structures Rule	2018-2022, on each unit's permit renewal cycle	Requires controls to limit impacts to aquatic life at cooling water intake structures	Owners of units with once-through cooling systems may need to install or upgrade controls
Steam Electric Effluent Limitation Guidelines	Three years after publication of final rule*	Regulates toxic metal contaminants in water discharges	Owners of coal units may need to upgrade wastewater treatment processes, but most are anticipated to be compliant as currently operated
Coal Combustion Residuals Disposal Rule	Five years after publication of final rule*	Regulates disposal of coal ash in impoundments and landfills	Owners of coal units may be required to retrofit or close on-site coal ash impoundments
Clean Power Plan	2020-2029 (interim goal); 2030 onwards (final goal)	Sets carbon dioxide emissions limits for existing units	Rule has implications for most fossil-fuel fired generation in ERCOT, as well as for renewable energy and energy efficiency programs

*Subject to timing of final rule

Note that Table 1 is not a comprehensive list of environmental regulations with implications for generation in ERCOT. There are other pending environmental regulatory developments that could also impact generation resources in ERCOT that were not considered in this study. For example, EPA recently issued a proposal to tighten the National Ambient Air Quality Standard (NAAQS) for ozone. This would have implications for nonattainment areas in Texas, as well as future adjustments to cross-state air pollution regulations. Another example is the implementation of the 2010 NAAQS for SO₂. ERCOT continues to monitor these and other environmental regulatory developments closely to ascertain their impacts for grid reliability.

1.2. Prior ERCOT Studies of Environmental Regulations

ERCOT has previously studied the potential impacts of environmental regulations on generation resources in the ERCOT region to understand the potential impacts to grid reliability. The study methodology used in this report is generally consistent with these previous studies.

In June 2011, ERCOT studied the potential impacts of four proposed environmental regulations – 316(b), MATS, CSAPR, and the coal ash disposal rule.¹ The analysis evaluated the economic value of affected

¹ Electric Reliability Council of Texas, Inc. *Review of the Potential Impacts of Proposed Environmental Regulations on the ERCOT System*, June 2011. Available at http://www.ercot.com/content/news/presentations/2011/ERCOT_Review_EPA_Planning_Final.pdf.

generating units based on likely compliance requirements and future market conditions. The study found that a significant amount of coal retirements would be unlikely, unless several factors, such as low natural gas prices and carbon emission fees, combine to significantly reduce the economic viability of coal generation. However, the study results indicated that a closed-loop cooling tower requirement under the 316(b) rule could result in the retirement of almost 10,000 MW of gas-fired generation, much of which is located in or near Dallas/Fort Worth and Houston. The study found that these retirements could result in localized transmission system impacts in these urban areas.

The potential retirements of gas units identified in the June 2011 study were driven by an assumption that the 316(b) rule would require cooling tower retrofits at existing units. However, the 316(b) final rule, issued in June 2014, did not impose this requirement. Instead, the final rule requires modified traveling screens with fish return systems – a more modest capital investment compared to cooling tower retrofits. The cost of retrofitting existing units with cooling towers is an order of magnitude higher compared to the requirements of the final rule. Based on the final rule provisions, ERCOT anticipates that the impacts of compliance with the 316(b) rule will be modest, as discussed in Section 2.4.

It was also assumed in the June 2011 study that Texas would only be included in the CSAPR program for ozone season NO_x emissions, based on the requirements of the proposed rule. However, the CSAPR final rule, published in July 2011, included Texas in the program for annual SO₂ and NO_x emissions as well. To address the change to the CSAPR program, ERCOT conducted a subsequent study in September 2011.² The CSAPR study estimated potential capacity reductions ranging from 3,000 to 6,000 MW during off-peak months, and 1,200 to 1,400 MW during peak months. In developing scenarios for evaluation, ERCOT considered known compliance plans of resource owners, the potential for increased unit maintenance outages due to repeated daily dispatch of traditionally base load coal units, and limited availability of low-sulfur coal imported into Texas from western states (i.e., Powder River Basin (PRB) coal).

Subsequent to the CSAPR study, the U.S. Court of Appeals stayed the rule in December 2011. In 2012, EPA made minor adjustments to the CSAPR program, including increasing the state budget for Texas and allowing more flexibility for compliance in the initial phase of the program. These changes could help mitigate the impacts found in the September 2011 study. Additionally, since 2011 ERCOT has seen the seasonal mothballing of almost 2,000 MW of coal capacity. This has been due primarily to lower wholesale power prices, and not environmental regulations. Even with these changes, the implementation of CSAPR in January 2015 is likely to have impacts for coal-fired capacity in ERCOT. Specifically, compliance with the SO₂ limits may impact the operations of coal units with weak controls, as discussed in Section 2.2.

In the summer of 2013, ERCOT conducted a survey on the impacts of the MATS rule for coal-fired generation. ERCOT did not publish these results, but the survey responses indicated that 6,500 MW of capacity had not yet determined a MATS compliance strategy at the time. This raised questions about whether a significant portion of ERCOT's coal-fired capacity would meet the April 2015 deadline for MATS compliance. The 2013 survey results have been updated based on responses to the survey in this study. As discussed in Section 3, the updated survey results show that owners of most coal-fired units in ERCOT have identified compliance strategies for MATS.

² Electric Reliability Council of Texas, Inc. *Impacts of the Cross-State Air Pollution Rule on the ERCOT System*, September 2011. Available at http://www.ercot.com/content/news/presentations/2011/ERCOT_CSAPR_Study.pdf.

2. Requirements and Costs of Environmental Regulations

Each regulation considered in this study has distinct compliance requirements that will affect generators in ERCOT. The costs associated with meeting these requirements vary, with some regulations posing more modest costs compared to others. Both individually and cumulatively, these costs will influence resource owners' decisions about whether to retrofit or retire units to comply with environmental regulations. The sections that follow discuss the specific compliance requirements and associated costs for each environmental regulation considered in this study.

2.1. Mercury and Air Toxics Standards

The MATS rule sets emissions limits for hazardous air pollutants emitted from power plants. The regulated pollutants include acid gases, toxic metals, and particulate matter. The rule will impact coal-fired generators in the ERCOT region. Owners of units without sufficient controls to meet the rule limits will need to install new control technologies to comply. Compliance options include scrubbers, activated carbon injection (ACI), dry sorbent injection (DSI), and use of PRB coal in the fuel mix. Generators have until April 2015 to comply, although resource owners may apply for one-year compliance extensions from the Texas Commission on Environmental Quality (TCEQ). There is also an option for an additional year (to April 2017) for reliability critical units. Table 2 summarizes the impacts of MATS for units in ERCOT.

Given the April 2015 compliance date for MATS, there is some risk for units that have not yet completed the necessary modifications. Further, for those units with compliance extensions, there is risk that the owners of these units may choose to retire rather than comply with MATS, especially in light of recent Regional Haze developments and eventual compliance with the Clean Power Plan. Given the timeframe for MATS compliance, this could present a risk to reliability if a significant number of units do not meet the MATS requirements over the next two years.

The costs of retrofitting units to comply with MATS will vary depending on the control technology selected. The most common option in the ERCOT region is the installation of DSI and/or ACI systems. The survey, discussed in Section 3, asked resource owners to report the capital and operations and maintenance (O&M) costs associated with outstanding unit modifications for MATS. Based on this information, ERCOT estimates an average capital cost for MATS compliance of approximately \$10/kW, and an average O&M cost of \$0.75/MWh. These costs are the averages of the information reported on the survey, and do not correspond to a specific retrofit technology.

2.2. Cross-State Air Pollution Rule

The Cross-State Air Pollution Rule (CSAPR) and its precursor, the Clean Air Interstate Rule (CAIR), focus on the impact of upwind states' emissions to downwind states' air pollution. Both rules set state-wide

Table 2: Mercury and Air Toxics Standards Impacts

Mercury and Air Toxics Standards	
Description	Sets limits on hazardous air pollutant emissions at power plants
Compliance date	April 2015 (April 2016 with extension)
Impacts for coal units	
Compliance requirements	Sets emissions limits for acid gases, toxic metals, and particulate matter
Potential compliance actions	Retrofit units with scrubbers, dry sorbent injection, activated carbon injection; use PRB coal in fuel mix
Potential compliance costs	\$10/kW capital cost \$0.75/MWh O&M cost
Impacts for natural gas units	
Compliance Requirements	None
Potential compliance actions	n/a
Potential compliance costs	n/a

limits for annual SO₂, annual NO_x, and ozone season NO_x emissions. The CAIR limits have been enforced after a U.S. Court of Appeals decision stayed CSAPR in December 2011. However, in April 2014 the Supreme Court overturned this decision. In October 2014 the stay on CSAPR was lifted, and compliance with CSAPR will begin in January 2015. Table 3 summarizes the impacts of CSAPR for units in ERCOT.

Most fossil fuel-fired generators in ERCOT are subject to both CSAPR and CAIR. Under both programs, each unit is allocated a certain number of emissions allowances, and must either control emissions or purchase additional allowances if their allocations are not sufficient to cover their emissions for the year. The CSAPR limits are more stringent than the current requirements in the CAIR program.

Within the ERCOT region, compliance with the CSAPR SO₂ limits is likely to be difficult for coal-fired capacity. In ERCOT's modeling of CSAPR, discussed in Section 4, the CSAPR SO₂ limit was more difficult for the ERCOT system to meet than the annual and ozone season NO_x limits. Emissions of SO₂ are primarily a concern for coal-fired capacity because the combustion of natural gas emits very low amounts of SO₂. Owners of coal-fired capacity without tight SO₂ controls will likely need to purchase emissions allowances, install or improve unit controls, or reduce operations during non-peak seasons to stay within their allotted emissions allowances.

There is also some uncertainty regarding the availability of SO₂ emissions allowances for purchase by resource owners in Texas. Texas is part of the group 2 trading program for SO₂. The power sector in other group 2 states is primarily vertically integrated, which raises questions about the incentives for resource owners in those states to sell excess allowances.

As part of the modeling analysis in this study (see Section 4), ERCOT estimated an SO₂ emission price of \$800/ton, an ozone season NO_x emission price of \$1,600/ton, and an annual NO_x emission price of \$1,000/ton. These emissions prices were derived based on modeling iterations, and do not correspond to actual emissions prices under the CSAPR program. However, based on these estimates and the emissions rates reported in the survey (see Section 3 and Appendix A), the potential CSAPR compliance costs for coal-fired generation resources can range from \$0.75/MWh for a well-controlled unit to \$7.25/MWh for an uncontrolled unit. Similarly, the costs for natural gas units could range from \$0.10 to \$2.75/MWh, depending on the type of generation technology and installed controls.

2.3. Regional Haze

The Regional Haze program regulates air emissions to improve visibility in national parks. The program requires states to develop State Implementation Plans (SIPs) that require the "best available retrofit technology" (BART) for facilities that contribute to haze in national parks. In November 2014, EPA proposed a Federal Implementation Plan (FIP) disapproving portions of the Texas SIP for regional haze, and setting SO₂ emissions limits for certain coal-fired units in Texas that contribute to air pollution in Big Bend and the Guadalupe Mountains in Texas, and the Wichita Mountains in Oklahoma. Table 4 summarizes the impacts of EPA's proposed Regional Haze FIP for units in the ERCOT region.

Table 3: Cross-State Air Pollution Rule Impacts

Cross-State Air Pollution Rule	
Description	Regulates air emissions to address cross-state air pollution
Compliance date	January 2015
Impacts for coal units	
Compliance requirements	Cap and trade program for NO _x and SO ₂ emissions
Potential compliance actions	Purchase allowances, upgrade controls, or reduce production
Potential compliance costs	\$0.75-\$7.25/MWh, based on ERCOT modeled allowance prices
Impacts for natural gas units	
Compliance Requirements	Cap and trade program for NO _x and SO ₂ emissions
Potential compliance actions	Purchase allowances, upgrade controls, or reduce production
Potential compliance costs	\$0.10-\$2.75/MWh, based on ERCOT modeled allowance prices

EPA's proposed FIP would require seven coal-fired units in Texas to upgrade their existing scrubbers, and seven units (five of which are located in ERCOT) to install new scrubber retrofits.³ The owners of these units would have three years to complete scrubber upgrades and five years to complete scrubber retrofits, from the effective date of the final FIP rule. If EPA publishes the final rule as anticipated in 2015, then the scrubber upgrades and retrofits would be required by 2018 and 2020, respectively. By 2020, the power sector would also need to begin complying with the interim CO₂ emissions limits in the proposed Clean Power Plan.

Though EPA estimates that meeting these requirements is cost-effective on a \$/ton SO₂ removed basis, they will likely pose a significant capital investment for these facilities. In a previous analysis, ERCOT estimated the cost to install scrubbers at \$450/kW to \$573/kW.⁴ This does not include any associated increases to O&M costs. The affected resource owners will need to determine whether they will be able to recoup the costs of these scrubber upgrades and retrofits, or else retire or mothball the units. ERCOT anticipates that some of the affected resource owners may choose to retire or mothball their units, due to the current economics in the ERCOT market and pending compliance with other environmental regulations, particularly the Clean Power Plan. If a large portion of the affected capacity retires within the same timeframe, there could be implications for resource adequacy and grid reliability.

2.4. Cooling Water Intake Structures

EPA's 316(b) Cooling Water Intake Structure rule requires controls to limit impacts to aquatic life at cooling water intake structures. Any generator that withdraws water from a "water of the U.S." for cooling purposes is subject to the rule provisions. Unlike most of the other rules considered by the survey, the 316(b) rule will have implications for both coal and natural gas units.⁵ Generators will need to comply from 2018 through 2022 in accordance with their water permit renewal cycle. Table 5 summarizes the impacts of the 316(b) rule for units in ERCOT.

Owners of units with cooling towers or cooling ponds ("closed-loop" cooling) are unlikely to need to take significant action under the final rule provisions. Conversely, owners of units with once-through systems will likely need to install or upgrade modified traveling screens and fish return systems, or install alternative control technologies. Many already have some controls installed at their intakes; however,

Table 4: Regional Haze Program Impacts

Regional Haze Program	
Description	Regulates air emissions to improve visibility in national parks
Compliance date	Three to five years after final FIP issued (i.e., 2018-2020)
Impacts for coal units	
Compliance requirements	Sets SO ₂ emissions limits for 13 coal-fired units in the ERCOT region
Potential compliance actions	Install or upgrade scrubbers
Potential compliance costs	\$450-\$573/kW
Impacts for natural gas units	
Compliance Requirements	No incremental compliance requirements
Potential compliance actions	n/a
Potential compliance costs	n/a

³ The units required to upgrade existing scrubbers are Limestone 1 and 2, Martin Lake 1, 2, and 3, Monticello 3, and Sandow 4. The units required to retrofit with new scrubbers are Big Brown 1 and 2, Monticello 1 and 2, Coletto Creek, and Tolk 172B and 171B. The two Tolk units are not located in the ERCOT Interconnection. The proposed FIP would also set an emission limit for San Miguel, but meeting the limit is not anticipated to require additional controls.

⁴ Electric Reliability Council of Texas, Inc. *Review of the Potential Impacts of Proposed Environmental Regulations on the ERCOT System*, June 2011. Available at http://www.ercot.com/content/news/presentations/2011/ERCOT_Review_EPA_Planning_Final.pdf.

⁵ Nuclear generation resources also use cooling water and would be subject to the 316(b) rule if the cooling water is withdrawn from a "water of the U.S."

these controls may need to be upgraded to comply with the rule provisions. Because compliance is phased in over the permit cycle, it is unlikely that the compliance timeframe would result in concurrent unit outages.

As described in Section 1.2, a previous ERCOT study estimated that a closed-loop cooling tower requirement under the 316(b) rule could result in the retirement of almost 10 GW of gas-fired generation.⁶ That study estimated the cost of retrofitting existing units with cooling towers at \$200/kW. However, the 316(b) final rule did not include such a requirement. The costs of installing modified traveling screens and fish return systems are modest compared to the costs of retrofitting units with cooling towers. ERCOT estimates that the capital costs of the application of this technology at a fossil-fueled power plant generally range from \$5-\$25/kW, based on EPA's cost analysis of the rule⁷ and information reported on the generator surveys, and consultation with Black & Veatch.⁸ ERCOT estimates the corresponding O&M costs at \$0.10-\$0.50/MWh, based on EPA's cost analysis. These values represent an order of magnitude estimate and are intended only to provide an illustrative comparison to the costs of compliance with other regulations.

Based on the information available to ERCOT, there are two potential risks posed by the 316(b) rule. First, much of the capacity requiring modifications consists of older gas steam units operating at average annual capacity factors well below 10%. There is likely to be little opportunity for owners of these units to recoup the costs of complying with the 316(b) rule if significant capital investments are required. Although potential retirements would be phased over the 2018 to 2022 compliance period, the retirement of this much capacity over a short timeframe could impact grid reliability and transmission constraints. Second, in the final rule EPA gave permitting authorities discretion to require additional controls to address entrainment on a case-specific basis. To the extent that additional requirements are imposed in Texas, there could be implications for grid reliability, particularly during peak summer months.

2.5. Coal Ash Regulations

EPA has currently proposed two regulations pertaining to coal ash waste. The Steam Electric Effluent Limitation Guidelines (ELG) rule regulates toxic metal contaminants in water discharges, which result from contamination by coal ash and combustion control technology residues. The Coal Combustion Residuals (CCR) Disposal Rule proposes to regulate coal ash under the Resource Conservation and

Table 5: 316(b) Rule Impacts

316(b) Cooling Water Intake Structures Rule	
Description	Requires controls to limit impacts to aquatic life at cooling water intake structures
Compliance date	2018-2022, on each unit's permit renewal cycle
Impacts for coal units	
Compliance requirements	Requires controls for units with once-through cooling
Potential compliance actions	Install or upgrade modified traveling screens and fish return systems
Potential compliance costs	\$5-\$25/kW capital cost \$0.10-\$0.50/MWh O&M cost
Impacts for natural gas units	
Compliance Requirements	Requires controls for units with once-through cooling
Potential compliance actions	Install or upgrade modified traveling screens and fish return systems
Potential compliance costs	\$5-\$25/kW capital cost \$0.10-\$0.50/MWh O&M cost

⁶ Electric Reliability Council of Texas, Inc. *Review of the Potential Impacts of Proposed Environmental Regulations on the ERCOT System*, June 2011. Available at http://www.ercot.com/content/news/presentations/2011/ERCOT_Review_EPA_Planning_Final.pdf.

⁷ U.S. EPA, *Economic Analysis for the Final Section 316(b) Existing Facilities Rule and Technical Development Document for the Final Section 316(b) Existing Facilities Rule*, May 2014. Available at <http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/>.

⁸ The capital costs for a nuclear generation resource would likely be greater.

Recovery Act (RCRA). Table 7 and Table 6 summarize the impacts of the ELG rule and the coal ash disposal rule, respectively, for units in the ERCOT region.

EPA proposed the ELG rule in April 2013, and is under a court-ordered deadline to finalize the rule by September 2015. The rule would set limits on the concentrations of toxic metals in water discharges, which may require upgrades to wastewater treatment processes at some coal-fired units. However, it is anticipated that many units would be compliant with the rule provisions with their current controls, and therefore would not incur significant compliance costs. For those facilities requiring modifications, the costs of compliance will depend on the currently installed wastewater treatment controls and which regulatory option EPA selects in the final rule. Based on the information in EPA's cost analysis of the proposed rule, ERCOT estimated compliance capital costs at \$10-\$60/kW, and O&M costs at \$0.40-\$1.40/MWh. These values represent an order of magnitude estimate and are intended only to provide an illustrative comparison to the costs of compliance with other regulations.

The coal ash disposal rule proposes to regulate coal ash under RCRA as a Subtitle C special waste or as a Subtitle D non-hazardous waste. Listing under either Subtitle C or Subtitle D would require groundwater monitoring and place liner requirements on future disposal in impoundments and landfills; a more stringent Subtitle C listing would also require liner retrofits on existing coal ash impoundments. Though the rule contains provisions for both coal ash landfills and impoundments, the rule would primarily affect coal-fired generators with on-site coal ash impoundments, since these would be required to retrofit with liners or close under a Subtitle C listing. In 2011, NERC estimated the costs of compliance with the ash disposal rule at \$30 million per unit, plus incremental disposal costs of \$15-\$37.50/ton, depending on whether EPA regulates coal ash waste under Subtitle C or Subtitle D.⁹ Based on the capacities of potentially impacted units in ERCOT, the \$30 million capital cost translates to an average of \$50/kW.

Table 7: ELG Rule Impacts

Effluent Limitation Guidelines Rule	
Description	Regulates toxic metal contaminants in water discharges
Compliance date	Three years after publication of final rule (i.e., 2018)
Impacts for coal units	
Compliance requirements	Sets limits for toxic metal concentrations in wastewater
Potential compliance actions	Upgrade wastewater treatment processes to meet limits
Potential compliance costs	\$10-\$60/kW capital cost \$0.40-\$1.40/MWh O&M cost
Impacts for natural gas units	
Compliance Requirements	None
Potential compliance actions	n/a
Potential compliance costs	n/a

Table 6: Coal Ash Disposal Rule Impacts

Coal Combustion Residuals Disposal Rule	
Description	Regulates disposal of coal ash in impoundments and landfills
Compliance date	Five years after publication of final rule (i.e., 2019)
Impacts for coal units	
Compliance requirements	Requirements for future and existing (Subtitle C only) disposal
Potential compliance actions	Groundwater monitoring, liner requirements, liner retrofits (Subtitle C only)
Potential compliance costs	\$50/kW capital cost \$15-\$37.50/ton ash O&M cost
Impacts for natural gas units	
Compliance Requirements	None
Potential compliance actions	n/a
Potential compliance costs	n/a

⁹ North American Electric Reliability Corporation. *Potential Impacts of Future Environmental Regulations*, November 2011. Available at <http://www.nerc.com/files/epa%20section.pdf>.

2.6. Clean Power Plan

In June 2014, the EPA proposed the Clean Power Plan, which calls for reductions in the carbon intensity of the electric sector. The Clean Power Plan would set limits on the carbon dioxide (CO₂) emissions from existing fossil fuel-fired power plants, calculated as state emissions rate goals. For Texas, EPA has proposed an interim goal of 853 lb CO₂/MWh to be met on average during 2020 to 2029, and a final goal of 791 lb CO₂/MWh to be met from 2030 onward. EPA calculated the state-specific goals using a set of assumptions, referred to as “building blocks,” about coal plant efficiency improvements, increased production from natural gas combined cycle units, growth in renewables generation, preservation of existing nuclear generation, and growth in energy efficiency.

Currently, there is uncertainty as to the form compliance with the Clean Power Plan will take in Texas. For this reason, it is not possible to identify unit-specific compliance actions and associated costs at this time. ERCOT studied the potential system-level impacts of compliance with the Clean Power Plan through a modeling analysis, discussed in Section 4. Additionally, it is important to consider that resource owners will be making decisions about whether to retrofit their units to comply with other environmental regulations in light of eventual compliance with the Clean Power Plan.

Table 8: Clean Power Plan Impacts

Clean Power Plan	
Description	Sets carbon dioxide limits for existing units
Compliance date	2020-2029 (interim goal); 2030 (final goal)
Impacts for coal units	
Compliance requirements	No specific requirements; EPA assumes heat rate improvements. Likely to result in significant reductions in output from coal units.
Potential compliance actions	Uncertain at this time
Potential compliance costs	Unknown
Impacts for natural gas units	
Compliance Requirements	No specific requirements; EPA assumes increased utilization of combined cycle units
Potential compliance actions	Uncertain at this time
Potential compliance costs	Unknown

3. Generator Environmental Survey

To address the risks associated with environmental regulations, ERCOT developed a survey for fossil fuel-fired generation resource owners to gather information about potential unit-specific compliance strategies. The survey results provide information about the prospective compliance impacts to generation capacity in the ERCOT region in the coming years.

3.1. Survey Methodology

ERCOT administered the survey during July-August 2014. The survey was sent to all coal and natural gas-fired generation resource owners in ERCOT, including some owners of private use network (PUN) generation.¹⁰ The survey asked questions about unit emissions rates, installed control equipment,

¹⁰ ERCOT distributed the environmental surveys to a limited number of PUN generators, based on the amount of generation provided to the grid on an annual basis in 2013.

planned unit modifications, and prospective compliance strategies for MATS, CSAPR, 316(b), and the coal ash regulations.¹¹

ERCOT received survey responses from owners of 368 fossil fuel-fired units supplying power to the ERCOT grid, comprising 69,300 MW of capacity. This included 32 coal units, 198 natural gas combined cycle units, 46 natural gas steam units, 84 natural gas combustion turbine (simple cycle) units, and 8 other units. Figure 1 and Table 9 summarize the surveyed capacity by fuel type.

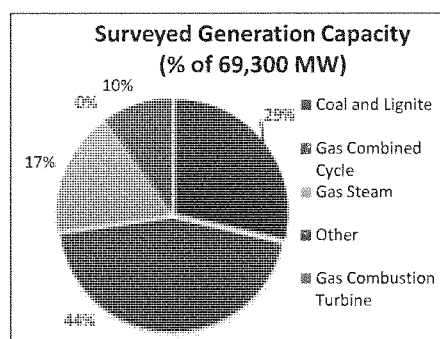


Figure 1: Surveyed Generation Capacity

Table 9: Surveyed Generation Capacity

Generation Type	# Units	Capacity (MW)	% of Surveyed Capacity
Coal and Lignite	32	19,800	29%
Natural Gas Combined Cycle	198	30,600	44%
Natural Gas Steam	46	12,050	17%
Natural Gas Combustion Turbine	84	6,600	10%
Other	8	250	0%
Total	368	69,300	100%

Once the completed surveys were received from resource owners, ERCOT analyzed and aggregated the survey responses. ERCOT followed up with a select number of resource owners for clarification on their responses.

3.2. Survey Results

The survey began with questions about plans for unit retirements, suspended operations, and planned modifications to comply with environmental regulations. No resource owners responded with plans for retirements or suspended operations, except for the previously announced plan to mothball the J.T. Deely 1 and 2 units. However, there is currently a great amount of uncertainty with regard to the compliance requirements of environmental regulations due to pending litigation and the current status of some of these regulations as proposed rules, which may change before they are finalized by EPA. Additionally, resource owners are only required to provide a 90-day notice that a unit will be retired or mothballed. Given the competitiveness of the ERCOT market and the current uncertainty surrounding environmental regulations, it is unlikely that generators would notify ERCOT of potential retirements or unit suspensions before the minimum notification deadline.

Next, the survey asked resource owners to report currently installed control technologies and average NO_x, SO₂, and CO₂ emission rates. These responses help identify potential compliance risks associated with the pending implementation of CSAPR, the Regional Haze program, and CO₂ regulations. Additional information on these responses is provided in Appendix A.

¹¹ This survey was developed and distributed prior to the U.S. Court of Appeals ruling granting EPA's motion to lift the stay on CSAPR, and EPA's issuance of a Federal Implementation Plan (FIP) for the Regional Haze program for Texas. These developments may change the compliance plans reported by resource owners on the survey.

The remainder of the survey asked resource owners to provide information about their prospective compliance status and planned compliance strategies for several environmental regulations. As noted previously, the reported compliance information is likely to change as compliance requirements become more certain. Even so, the survey results indicate that:

- Owners of most coal-fired units in ERCOT have identified compliance strategies for MATS. The most common compliance strategies reported were the installation of ACI or DSI systems. Though 21 units (14,500 MW) are anticipated to be compliant by the April 2015 deadline, 12 of these units (8,500 MW) have not yet completed the necessary modifications. The remaining 11 surveyed coal units (5,300 MW) have been granted compliance extensions to April 2016 by the TCEQ, or plan to apply for extensions.
- 72% of surveyed natural gas capacity anticipates compliance with the CSAPR limits. However, over half of surveyed coal capacity indicated uncertainty or needing to take some action to comply with the CSAPR limits.¹²
- 161 coal and natural gas-fired units in ERCOT (46,800 MW) are subject to the 316(b) rule, but most (118 units, or 32,600 MW) anticipate that they are already compliant with the rule. The remaining 43 units (14,200 MW) may require modifications to comply.
- 22 coal-fired units (14,200 MW) would be compliant with the ELG rule as proposed. The owners of the remaining 10 surveyed coal units (5,600 MW) may need to take some action to comply with the rule.
- 23 coal units (13,000 MW) in ERCOT have coal ash impoundments on-site, all of which would require compliance actions should EPA move forward with a Subtitle C listing of coal ash. With a Subtitle D listing, the owners of 7 units with impoundments (3,000 MW) reported that they anticipated being compliant as currently configured and operated. The remaining coal units with impoundments would require compliance actions.

ERCOT used these survey responses to inform modeling assumptions, and to determine the cumulative impacts of these regulations on ERCOT units, discussed in Section 5.1.

4. Modeling Analysis

While the environmental survey responses help identify vulnerabilities and risks to individual units resulting from a range of environmental regulations, this study also aimed to project how CSAPR, Regional Haze, and the Clean Power Plan may impact the resource mix and operations in the ERCOT region on the system level. To do so, ERCOT conducted a modeling analysis using stakeholder-vetted planning processes and methodologies consistent with ERCOT's regional Long-Term System Assessment studies. ERCOT developed several scenarios for modeling based on known or likely regulatory developments at the time of the study. The results of the modeling raise several potential reliability issues that will need to be addressed in ERCOT as environmental regulations, particularly the Clean Power Plan, are implemented. While ERCOT analyzed several potential future scenarios, this analysis was not meant to be a comprehensive study of all regulatory impacts and potential compliance pathways. Moreover, ERCOT does not take a position on whether the compliance methods modeled, such as a carbon price or emissions fee, are legally permissible under current law. The sections that follow describe the modeling methodology, summarize the results from the modeling analysis, and compare these results to EPA's analysis of the Clean Power Plan.

¹² This survey was completed prior to the U.S. Court of Appeals decision to grant EPA's motion to lift the stay on CSAPR in October 2014, and the EPA's subsequent issuing of an interim final rule in November 2014 that establishes January 2015 as the start of compliance.

4.1. Modeling Methodology

This study used Energy Exemplar's PLEXOS Integrated Energy Model to estimate changes to electric generation in ERCOT given a set of assumptions about future market trends and the implementation of environmental regulations. ERCOT modeled several distinct scenarios that considered different ways to implement the emissions limits, in comparison to a baseline. The modeling approach draws on stakeholder-vetted assumptions used in ERCOT's Long-Term System Assessment, with additional assumptions specific to this analysis that reflect the environmental regulations studied. The load forecast is based on ERCOT's neural network models that combine weather, demographic, and economic variables to project long-term trends.

The PLEXOS Integrated Energy Model uses mixed integer programming to model the power sector. In this study, ERCOT used the long-term modeling capability in PLEXOS to get an estimate of unit retirements and capacity additions over the 2015 to 2029 timeframe. The long-term expansion is based on economics, and does not consider reliability or operational challenges. Then, ERCOT used PLEXOS's short term modeling capability to mimic chronological hourly unit commitment and economic dispatch for the years 2020 and 2029. ERCOT elected to use the PLEXOS model for this study because it can simulate both real-world market operations and long term capacity expansion planning using either emission constrained or emission price scenarios.

4.1.1. Modeled Scenarios

In approaching this modeling analysis, ERCOT developed a set of scenarios that reflect the potential range of system impacts under likely regulatory outcomes and in light of ongoing trends in the electric sector. To do so, ERCOT focused on those environmental regulations most likely to have system-level impacts in ERCOT, rather than those with more limited or unit-specific implications. Though the 316(b), MATS, and coal ash regulations may cumulatively impact individual resource owners' decisions on whether to retire or mothball units, the impacts of these individual regulations are unlikely to impact overall trends on the ERCOT system as they are not expected to affect the economics of a significant number of units. For this reason, ERCOT focused its modeling efforts on the impacts of CSAPR, Regional Haze and the Clean Power Plan, as these regulations have the greatest potential to shift generation trends in ERCOT.

ERCOT evaluated CSAPR and the proposed Clean Power Plan using two methodologies. First, ERCOT considered scenarios with the emissions limits in these rules applied as a constraint, to allow the long-term simulation model to select the most cost-effective way to achieve compliance from electric generating resources. Second, emissions fees were used to cause the system to achieve the proposed standards. The benefit of the first approach is that it would be expected to minimize the overall cost to the system, and should lead to results that are comparable to the methodology utilized by the EPA in its analysis of the impacts of the Clean Power Plan. However, it may not be a change that is achievable within the current electricity market design in ERCOT.¹³ For this reason, ERCOT also modeled emissions fee scenarios. The CSAPR rule uses such an emissions trading scheme to achieve compliance with the limits. Though a carbon price is not an explicit component of the Clean Power Plan proposal, it is often discussed as an option for complying with the limits, and is included here in order to assess the system impacts of a potential approach to compliance. By modeling the carbon price option, ERCOT does not take any position about the policy merits or legal permissibility of such a compliance approach. With

¹³ Electric supply is deregulated in the ERCOT region at the wholesale and retail level. As a result, electric generation and construction of new capacity is driven by market forces. As a result, there is no mechanism to force the ERCOT system to achieve compliance with environmental regulations in a specific manner. Resource owners will make decisions about how to operate existing resources and whether to add new capacity based on market forces.

regards to the Regional Haze program, ERCOT modeled the requirements in EPA's proposed FIP as additional costs for impacted generators.

ERCOT modeled six distinct scenarios over the timeframe 2015 to 2029 to evaluate the impacts of CSAPR, Regional Haze, and the Clean Power Plan in the ERCOT region. Table 10 summarizes the assumptions of the six scenarios. The first scenario estimated a baseline of the ERCOT system under current market trends against which anticipated CSAPR and Clean Power Plan changes could be compared. Then, ERCOT modeled five scenarios to simulate the potential impacts of CSAPR, Regional Haze, and the Clean Power Plan. CSAPR and the Clean Power Plan are imposed as system constraints in scenarios 2, 3, and 4; and as emissions prices in scenarios 5 and 6. Scenario 3 also includes the requirements of EPA's proposed Regional Haze FIP for Texas.

Table 10: Scenarios Modeled in Analysis

Scenario*	Environmental Regulations Included in Scenario			Emissions Limits Modeled As Limit or Emissions Price	
	CSAPR	Regional Haze	CPP	Limit	Price
1. Baseline	No	No	No	No	No
2. CSAPR Limits	Yes	No	No	Yes	No
3. CSAPR Limits and Regional Haze	Yes	Yes	No	Yes	No
4. CSAPR and CO ₂ Limits	Yes	No	Yes	Yes	No
5. CSAPR Prices and \$20/ton CO ₂ Price	Yes	No	Yes	No	Yes
6. CSAPR Prices and \$25/ton CO ₂ Price	Yes	No	Yes	No	Yes

*Note: In the summary report of this analysis published on November 17, 2014, scenarios 4 through 6 were labeled as "CO₂ Limit", "\$20/ton CO₂", and "\$25/ton CO₂", respectively. Scenarios 2 and 3 were not included in the summary report

4.1.2. ERCOT Long-Term Modeling Assumptions

This study uses stakeholder-vetted assumptions consistent with ERCOT's Long Term System Assessment (LTSA).¹⁴ Specifically, the baseline scenario in this study is based on the Current Trends scenario from the 2014 LTSA, and the subsequent scenarios were layered on top of the baseline scenario assumptions. The LTSA Current Trends scenario assumes that current policies and regulations will remain in place and that no new policies will be introduced. Table 11 summarizes the model input assumptions used in the LTSA Current Trends scenario.

These assumptions include the anticipated expiration of the Production Tax Credit (PTC) and phase out of the Investment Tax Credit (ITC). The PTC expiration assumption is particularly significant because it influences the amount of wind capacity additions predicted by the model.

¹⁴ For more information, visit ERCOT's Regional Planning Group (RPG) website at <http://www.ercot.com/committees/other/rpg/index.html>.

ERCOT did not require the system to maintain a specific reserve margin in the LTSA Current Trends scenario, or in the scenarios modeled in this analysis. The target reserve margin criterion in ERCOT is not binding and it is possible that market conditions will result in a lower reserve margin than the recommended level. By contrast, EPA's modeling of the impacts of the Clean Power Plan, described in Section 4.3, required that ERCOT maintain a 13.75% reserve margin. This difference in assumptions results in different amounts of capacity additions, and has implications for grid reliability.

Table 11: LTSA Model Input Assumptions

Model Input	Assumption
Natural gas price	Average of EIA AEO 2014 and Wood Mackenzie forecast
Coal price	Average of EIA AEO 2014, EIA AEO 2012, and SNL price forecast
Wind production profiles	Based on county-specific hourly production profiles provided by AWS Truepower
Solar production profiles	Based on county-specific hourly production profiles provided by URS
Unit Retirements	Based on economics
Capacity additions	Based on economics
New Capacity	Taken from EIA AEO 2014 and escalated at 2.4% per year; solar capital costs assumed to decrease over time
Capital Costs	
Production Tax Credit (PTC)	Expired as per current law
Investment Tax Credit (ITC)	Phased out as per current law
Load growth	Peak increases at an average of 1.25% per year and energy increases at an average 1.68% per year
LNG Exports	Assumes inclusion of Freeport LNG Project
Demand response and energy efficiency	Assumed current penetration levels
Reserve margin	Not imposed as a system requirement
Environmental Regulations	Did not impose any constraints on emissions

4.1.3. Modeling Assumptions Specific to this Study

Though the baseline scenario in this analysis is derived from the LTSA Current Trends scenario, ERCOT modified several of the assumptions to incorporate updated information or better reflect the modeled environmental regulations. First, ERCOT assumed lower solar capital costs compared to those used in the LTSA Current Trends scenario. After review of information provided by stakeholders and updated reports by the National Renewable Energy Laboratory (NREL) and Lazard, it is clear that solar capital costs continue to decline at a rapid rate. To be more in line with these lower costs, solar capital costs were lowered in the near-term years of this study to reflect this trend. ERCOT estimated solar capital costs based on a review of information provided by Lazard,¹⁵ Solar Energy Industries Association,¹⁶ and Citi Research.¹⁷ All solar capacity additions are assumed to be utility-scale photovoltaic with single-axis tracking. Figure 2 displays the solar capital costs used by ERCOT in this analysis.

¹⁵ Lazard. *Lazard's Levelized Cost of Energy Analysis – Version 8.0*, September 2014. Available at <http://www.lazard.com/pdf/levelized%20cost%20of%20energy%20-%20version%208.0.pdf>.

¹⁶ Greentech Media, Inc and Solar Industries Association. *U.S. Solar Market Insight Report. Q1 2014*. Confidential Report.

¹⁷ Citi Research. *Launching on the Global Power Sector: The Sun Will Shine but Look Further Downstream*. February 6, 2013. Confidential Report.

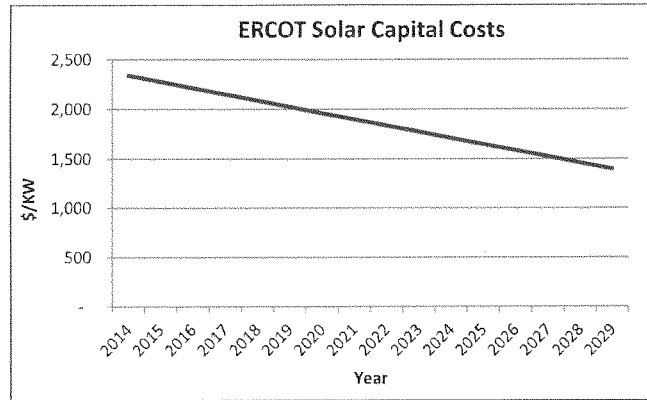


Figure 2: ERCOT Solar Capital Costs

As in the LTSA, natural gas price projections are based on an average of the Energy Information Administration (EIA) Annual Energy Outlook (AEO) 2014 forecast and the forecast from Wood Mackenzie, shown in Figure 3. The same natural gas price assumptions were applied in all scenarios.

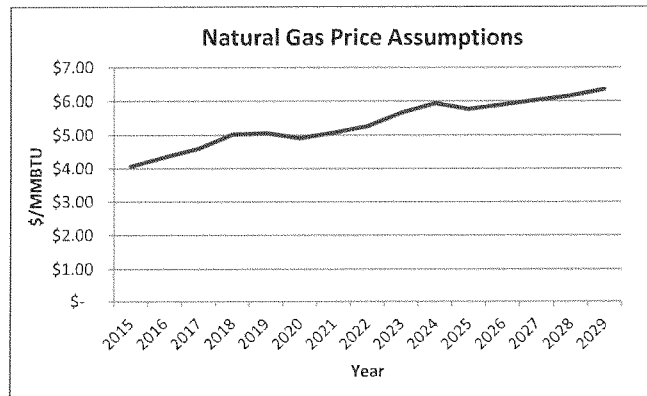


Figure 3: Natural Gas Price Assumptions

There is inherent uncertainty in forecasts of future trends, and changes to the capital cost and fuel price assumptions would likely impact the results of this analysis. For example, a lower solar capital cost would result in more, and possibly earlier, solar capacity additions compared to those found in this study. Along the same lines, a higher price of natural gas could result in higher compliance costs if environmental regulations result in a shift from coal to natural gas capacity.

With regard to the generation fleet, ERCOT modeled the capacity listed in ERCOT's May 2014 Capacity, Demand, and Reserves (CDR) report,¹⁸ with the addition of planned generation resources that had started construction by Summer 2014, as well as the full capacity of PUNs.¹⁹ Table 12 shows the baseline capacity assumptions used in the modeling. Generation from wind and solar resources was modeled based on the same wind and solar production profiles used in the LTSA. These profiles estimate the amount of wind and solar resources available for every hour of the year, based on the 2010 weather year.

ERCOT developed assumptions in order to apply the CSAPR, Regional Haze, and Clean Power Plan requirements to the ERCOT system. In the CSAPR program, states are assigned mass-based limits on how much SO₂ and NO_x they can emit. ERCOT scaled the limits for Texas based on the relative amount of load served by ERCOT within Texas to derive ERCOT-specific limits. Conversely, the Clean Power Plan limits are set as an emissions rate (lb/MWh). ERCOT evaluated the limits in the Clean Power Plan by applying the proposed emissions rate limits for Texas (in lb/MWh) directly to the ERCOT system. ERCOT applied the CO₂ limit only to those units that would be subject to the Clean Power Plan based on the provisions in EPA's proposal.

In the price scenarios, ERCOT assumed an SO₂ emission price of \$800/ton, an ozone season NO_x emission price of \$1,600/ton, and an annual NO_x emission price of \$1,000/ton. ERCOT estimated these prices based on a series of model iterations as part of this study.

ERCOT did not attempt to calculate a carbon price to precisely meet the emissions limits. Instead, ERCOT modeled a carbon price range within which the system is anticipated to achieve the Clean Power Plan emissions standards.

To model the Regional Haze requirements, ERCOT added the costs of complying with the Regional Haze requirements to units' fixed costs – for those units with requirements for scrubber upgrades or retrofits in EPA's proposed FIP. The analysis uses the same capital costs for scrubber upgrades and scrubber retrofits, due to data limitations.

Due to data availability limitations, ERCOT was only able to model through 2029 in this analysis. In the CSAPR and CO₂ limit scenario, to approximate compliance with the final goal in the Clean Power Plan, ERCOT applied the final CO₂ limit as a constraint over 2028 to 2029, and the interim CO₂ limit over 2020 to 2027. In this scenario, the ERCOT Interconnection was required to meet the interim CO₂ limit every year between 2020 and 2027 and the final CO₂ limit in 2028 and 2029.

Because this study focused on the ability of the ERCOT fleet to meet emissions limits requirements, it was important to develop a more robust emissions rate profile than the generic emissions factors typically used in ERCOT's long-term studies. To do so, ERCOT used unit-specific emissions data from EPA's Air Markets Program Data website.²⁰ ERCOT calculated unit-specific average monthly emissions rates based on data reported over the past three years. In some cases, the data was adjusted to account for data availability issues, changes to system configurations, and to remove major outliers. A subset of the data was compared to the emissions rates reported in the generator environmental surveys to

Table 12: Baseline Capacity Assumptions

Fuel Type	Capacity (MW)
Nuclear	5,200
Coal	19,900
Natural Gas	58,900
Wind	16,700
Solar	250
Hydro	500
Other	1,000
Total	102,450

¹⁸ ERCOT's Report on the Capacity, Demand, and Reserves in the ERCOT Region is available at <http://www.ercot.com/gridinfo/resource/index.html>.

¹⁹ In addition to PUN capacity, ERCOT also separately modeled PUN load.

²⁰ For more information, visit <http://ampd.epa.gov/ampd/>.

validate the calculated emissions rates. For units for which this information was not available, ERCOT developed an average emissions profile by generation technology type based on the available data.

Finally, in the baseline and CSAPR limit scenario ERCOT assumed energy efficiency savings at 1% of load for all modeled years, consistent with current levels of energy efficiency as measured by the Electric Utility Marketing Managers of Texas (EUMMOT).²¹ For the scenarios with the Clean Power Plan, ERCOT assumed growth in energy efficiency savings to a level of 5% by 2029. By contrast, EPA's building blocks assumed Texas could achieve a cumulative 9.91% savings from energy efficiency by 2029. ERCOT did not use the energy efficiency savings level estimated by EPA because ERCOT believes that a 5% savings level represents a moderate energy efficiency growth assumption, between the current level of savings and EPA's goal. ERCOT's more moderate assumption is also consistent with the approach taken by the Mid-Continent Independent System Operator (MISO) in its analysis of the impacts of the Clean Power Plan.²² MISO modeled three energy efficiency assumptions: base energy efficiency trends, EPA's Building Block 4, and 50% of EPA's Building Block 4. ERCOT's approach of using 5% is consistent with the third assumption modeled by MISO.

4.1.4. Load Forecast Development

The load forecasts used in this analysis were produced using a set of neural networks to capture and project the long-term trends extracted from historical load data. The long-term trend in monthly energy was modeled separately for each of the eight weather zones in ERCOT. The models incorporated economic, demographic, and weather data to develop the monthly energy forecast.

After the calculation of the monthly energy forecast, the development of the hourly load forecast required the allocation of that monthly energy to each hour in the month. A total of 864 neural network models were developed to produce hourly energy allocations for the twelve months. ERCOT validated the models by back-casting the hourly load allocations against several years of historical hourly load. Model validation was conducted by using historical monthly energy in the modeling networks to back-cast the hourly loads for each day in the historical load database.

A key input of both energy models is the forecasted weather. A normal (typical) weather hourly profile is used in both models. Normal weather means what is expected on a 50% probability basis; i.e., that the forecast for the monthly energy or peak demand has a 50% probability of being under or over the actual energy or peak. This is also known as the 50/50 forecast.

ERCOT's analysis included 12 years of weather data (2002 to 2013). The methodology that ERCOT selected to create the "normal" weather year is commonly referred to as the Rank and Sort methodology. A forecast is created using each of the 12 years of historical weather data. The resultant hourly forecast is ordered from the largest value to the smallest value. The normal weather forecast is then determined by calculating the average of each ordered hourly value.

Another key input of both energy models is the forecast of the number of premises in each customer class. Premises are classified as residential, business (small commercial), or industrial. A weather normalized use per premise is also included in the model.

Premises forecasts are developed using various economic variables such as non-farm employment, housing stock, and population. The current condition of the United States economy and its future direction is an element of great uncertainty. Texas thus far has not been affected to the same extent as the United States as a whole by the current economic downturn. This has led to Texas having stronger

²¹ EUMMOT's *Energy Efficiency Accomplishments Report* is available at <http://www.texasefficiency.com/index.php/publications/reports>.

²² MISO. *GHG Regulation Impact Analysis*, July 30, 2014. Available at <https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140730/20140730%20PAC%20Item%2012a%20GHG%20Regulation%20Impact%20Analysis.pdf>.

economic growth than most of the nation. Since May of 2010, there has been reasonably close agreement between actual non-farm employment in Texas and Moody's base economic forecast. Given this trend, ERCOT used the Moody's base economic forecast of non-farm employment in these forecasts.

Figure 4 shows the ERCOT load forecast used in this analysis. Detailed documentation of ERCOT's Long-Term Load Forecast is available at <http://www.ercot.com/gridinfo/load/forecast/index.html>.

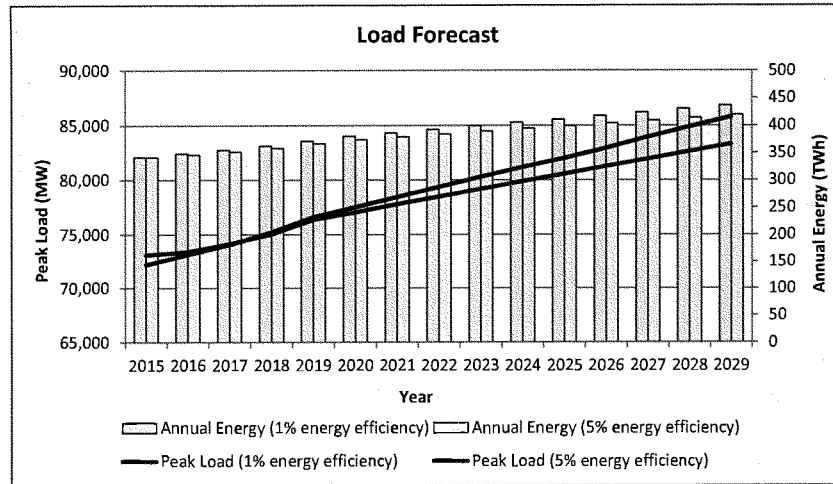


Figure 4: Load Forecast

4.2. Modeling Results

The six modeled scenarios resulted in different amounts of unit retirements and capacity additions, shifts in the generation mix, and different levels of air emissions due to the different ways the emissions limits were applied to the system. Overall, the scenario that included the CSAPR limit was very similar to the baseline, but with a slight shift away from coal toward natural gas. This shift occurs because the SO_2 limit is the binding constraint for the CSAPR limit scenario – in other words, the SO_2 limit is more difficult for the ERCOT system to meet. SO_2 emissions are much higher from coal units, so meeting the SO_2 limit will have more of an impact on coal capacity compared to natural gas. Meeting the Regional Haze requirements results in the retirement of coal-fired units, which are replaced primarily by natural gas combustion turbines. However, these requirements facilitate compliance with CSAPR – in the scenario that includes Regional Haze, none of the CSAPR limits are binding on the system. When the Clean Power Plan is added to the scenarios, the CO_2 limit becomes the binding constraint, resulting in an even larger shift away from coal toward natural gas, and an increased amount of renewable generation on the system. The emissions price scenarios result in similar trends, but represent an alternative mechanism for achieving compliance with the limits.

The modeling results predict 2,800 MW of unit retirements in the baseline, including 2,000 MW of gas steam retirements and 800 MW of coal unit retirements. The 800 MW of coal retirements in the baseline corresponds to the announced mothballing of CPS Energy's J. T. Deely units 1 and 2 in 2018. The natural gas retirements in the baseline are due to economics. There are a similar number of total retirements in the CSAPR limit scenario, but the retirements shift from natural gas steam to coal units. This is due to the impact of the CSAPR emissions limits, which makes natural gas-fired generation more economic compared to coal-fired generation. The addition of Regional Haze requirements results in almost 2,000 MW of additional coal unit retirements relative to the CSAPR limit scenario, or 3,000 MW relative to the baseline. Retirements increase further in the scenarios that include the Clean Power Plan, with 3,300 MW to 5,700 MW of incremental coal unit retirements compared to the baseline. Again, the lower amount of gas steam retirements compared to the baseline is due to the impacts of both the CSAPR and CO₂ limits. Table 13 summarizes cumulative unit retirements in 2029 by scenario.

Table 13: Unit Retirements by 2029

Generation Technology Type	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Retired Gas Steam (MW)	2,000	1,000	1,400	1,600	1,600	1,300
Retired Coal (MW)	800	2,000	3,900	4,100	4,100	6,500
Total Retirements (MW)	2,800	3,000	5,300	5,700	5,700	7,800

The model built new capacity to replace retiring units and meet forecasted demand. The baseline and CSAPR limit scenario saw 9,900 MW of new solar capacity and 4,600 MW of natural gas combustion turbines.²³ To adjust for increased coal unit retirements in the CSAPR limit and Regional Haze scenario, the model built an additional 1,800 MW of natural gas combustion turbines and an additional 100 MW of solar. As noted previously, ERCOT assumed the expiration of the PTC as per current law; this assumption resulted in no wind capacity additions in the first three scenarios. In the scenarios with the Clean Power Plan, retiring coal and gas steam capacity is replaced by solar, wind, and natural gas-fired

Table 14: Capacity Additions by 2029

Generation Technology Type	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Wind (MW)	0	0	0	3,400	2,800	3,500
Solar (MW)	9,900	9,900	10,000	12,500	12,600	13,500
Gas Combined Cycle (MW)	0	0	0	0	0	1,300
Gas Combustion Turbine (MW)	4,600	4,600	6,400	1,000	1,000	1,000
Total (MW)	14,500	14,500	16,400	16,900	16,400	19,300

capacity, as well as savings from energy efficiency measures. Compared to the baseline, the scenarios with the Clean Power Plan resulted in an additional 5,500 to 7,100 MW of renewable capacity additions, and fewer natural gas-fired capacity additions. Table 14 summarizes the cumulative capacity additions in 2029 for each scenario.

By 2029 there are significant renewable and natural gas capacity additions replacing retiring coal and gas steam capacity, as shown in Figure 5. However, in the scenarios with the Clean Power Plan, there are

²³ The solar capacity additions modeled in this study are consistent with the results of ERCOT's 2013 Long-Term Transmission Analysis, which indicated that large amounts of solar would be economic in ERCOT after 2020. For more information, visit ERCOT's Long-Term Study Task Force website at <http://www.ercot.com/committees/other/lts/index.html>.

some years for which the ERCOT capacity reserve margin may be considerably less than historically targeted for reliability, as capacity retires before new resources come online and energy savings from energy efficiency measures begin to materialize. These shortages occur towards the beginning of the compliance timeframe, between 2020 and 2022. During this timeframe, the modeled retirements and capacity additions result in a reserve margin 2% to 3% below the reserve margin in the baseline scenario for these years in the CO₂ limit and \$20/ton CO₂ scenarios.²⁴ By 2029, the reserve margin in these scenarios is comparable to the baseline scenario. The reserve margins are generally higher in the \$25/ton CO₂ scenario, because the increased price on CO₂ results in increased capacity additions. Reserve margins in the CSAPR limit and CSAPR limit and Regional Haze scenario are comparable to the baseline scenario throughout the modeled time period. As previously noted, ERCOT did not require the simulation model to maintain a specific reserve margin in the modeled scenarios because the reserve margin in ERCOT is a target, not a mandate.

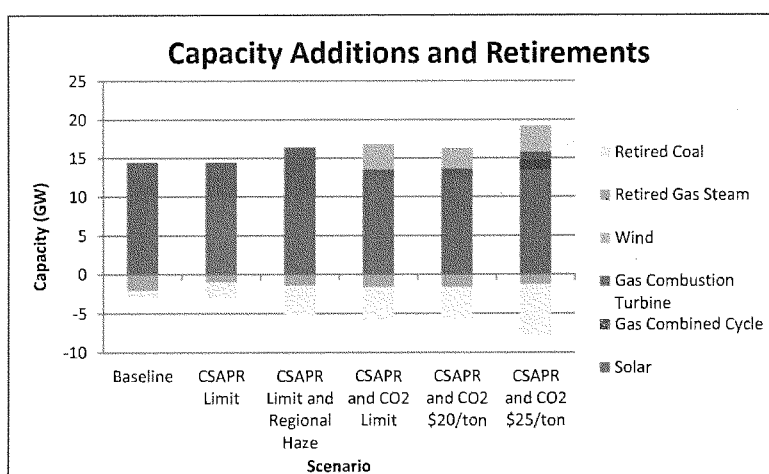


Figure 5: Capacity Additions and Retirements by 2029

Compliance with environmental regulations results in changes to the generation mix in the ERCOT region. Table 15 and Table 16 show the generation mix in 2020 and 2029, respectively, across the modeled scenarios. Under the CSAPR limits, generation from natural gas increases by about 3% in 2020 relative to the baseline, and generation from coal correspondingly decreases by 3%. This is due to the need to comply with the SO₂ limit in the CSAPR program, which affects coal-fired generation more than natural gas. The addition of Regional Haze continues this trend, with generation from natural gas increasing by 4% in 2020 relative to the baseline, and coal generation decreasing by 4%. Generation from renewables is comparable to the baseline in the CSAPR limit and CSAPR limit and Regional Haze scenarios. In the scenarios with the Clean Power Plan, there is a much larger shift away from coal and towards natural gas and renewable generation resources. In 2020, natural gas-fired units contribute 60%

²⁴ The ERCOT reserve margin is calculated using wind capacity contribution values of 12% for non-coastal resources and 56% for coastal resources, consistent with the ERCOT Board approved methodology outlined in Nodal Protocol Revision Request (NPRR) 611. The data used to calculate the wind capacity contribution is available on the ERCOT website at <http://www.ercot.com/gridinfo/resource/index.html>. For solar capacity, ERCOT assumes a 70% capacity contribution based on the modeled solar output during peak hours (16:00 to 18:00) as a percentage of total installed capacity.

or more of total energy in these scenarios, an increase of 16% to 19% compared to the baseline. There is a corresponding decrease in generation from coal-fired capacity. By 2029, renewable generation accounts for 21% to 22% of total generation in these scenarios, up from 17% of total 2029 generation in the baseline scenario.

Table 15: Generation Mix in 2020 (% of MWh)

Fuel Type	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Natural Gas (%)	44	47	48	60	60	63
Coal (%)	32	30	29	14	14	11
Wind (%)	12	12	12	15	15	16
Solar (%)	< 1	< 1	< 1	< 1	< 1	< 1
Nuclear (%)	10	10	10	10	10	10
Other (%)	1	1	1	< 1	< 1	< 1

Table 16: Generation Mix in 2029 (% of MWh)

Fuel Type	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Natural Gas (%)	45	47	49	53	53	55
Coal (%)	29	26	24	16	16	13
Wind (%)	11	11	11	14	14	14
Solar (%)	6	6	6	7	7	8
Nuclear (%)	9	9	9	9	9	9
Other (%)	< 1	< 1	< 1	< 1	< 1	< 1

The modeling results indicate that there will be increased amounts of generation from natural gas-fired resources under the emissions limits, which will increase the consumption of natural gas by the power sector. Compliance with the CSAPR limit alone and the CSAPR limit and Regional Haze result in a 6% increase in annual consumption of natural gas by the power sector in 2020 compared to the baseline, as shown in Figure 6. Again, the impact is larger with the inclusion of the Clean Power Plan, resulting in an increase in natural gas annual consumption of 35% to 50% relative to the baseline. The increase in consumption during peak months increases by 8% to 10% across the scenarios in 2020. This suggests that there is the potential to increase production from the ERCOT natural gas fleet annually, but less so during the peak summer months.

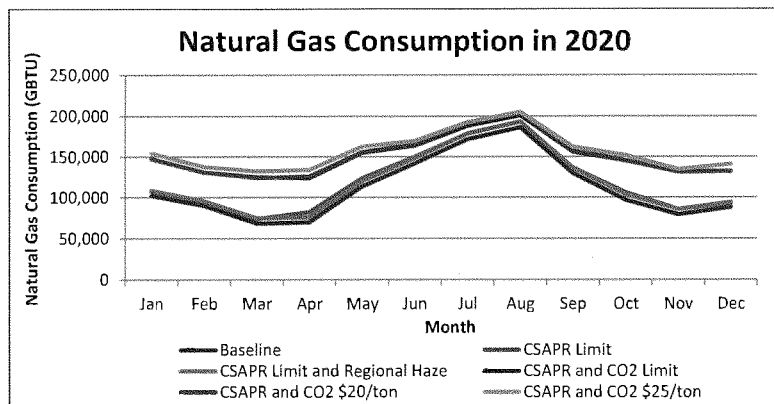


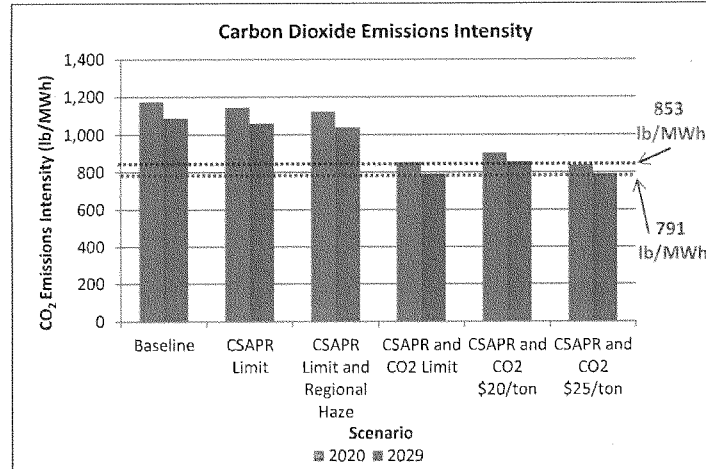
Figure 6: Natural Gas Consumption in 2020

The five scenarios resulted in different levels of carbon intensity. The \$20/ton CO₂ scenario resulted in a carbon intensity above both the interim and final emissions limits in the Clean Power Plan, while the \$25/ton CO₂ scenario resulted in a carbon intensity below the interim goal and approximately meeting the final goal (see Table 17 and Figure 7). In the baseline scenario, the ERCOT region's carbon intensity is at 1,175 lb/MWh in 2020 and 1,089 lb/MWh in 2029. The projected emissions intensity for ERCOT in the baseline is below the Clean Power Plan emissions rate goals for 19 other states, an indication of the impact that existing market policies and investments in transmission in Texas have had on maximizing the efficiency of the generating fleet and the integration of new technologies including renewable generation.

Table 17: Carbon Dioxide Emissions Intensity

CO ₂ Intensity	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton*	CSAPR and CO ₂ \$25/ton
2020 CO ₂ Intensity (lb/MWh)	1,175	1,145	1,123	853	905	840
2029 CO ₂ Intensity (lb/MWh)	1,089	1,061	1,041	791	857	792

*The 2020 emissions intensity for this scenario has changed slightly from the value included in the summary report due to a calculation error.

Figure 7: CO₂ Emissions Intensity

4.3. Comparison to EPA's Clean Power Plan Analysis

EPA conducted a modeling analysis of the Clean Power Plan. In the modeling, EPA applied the carbon limits to the U.S. electric system, and allowed their simulation model to solve for the most cost-effective solution. The analysis modeled compliance scenarios, relative to a baseline, that assumed compliance at the state-level and regional-level.²⁵ Because compliance options are less flexible under a state-level approach, and because the opportunity for Texas to participate in a regional plan is at this point uncertain, the results from the state-only compliance scenario are referenced below. Though EPA provided modeling results to the year 2050, the text below only summarizes modeling results for 2018 to 2030, since this timeframe more closely aligns with the timeframe for the implementation of the Clean Power Plan, and to ERCOT's modeling analysis.

Within the ERCOT region, EPA's modeling predicts that there may be 9 GW of coal unit retirements due to the Clean Power Plan, with most of the retirements occurring prior to the 2020 interim goal compliance date. While the modeling predicted up to 6 GW of coal unit retirements, ERCOT believes that there could be up to 9 GW of coal unit retirements resulting from the Clean Power Plan due to additional factors not considered in the model (discussed in Section 5.1.2). Similarly, both EPA's and ERCOT's modeling predicted a major shift in the generation mix in 2020 to comply with the interim goal, with substantially increased production from natural gas generation resources and substantially decreased production from coal generation resources. However, EPA's modeling resulted in much fewer renewable capacity additions compared to ERCOT's results and significantly more new natural gas generating capacity. The lower amount of renewable capacity additions is due to EPA's use of higher capital cost assumptions for new solar capacity. The larger amount of natural gas capacity additions is due in part to EPA's modeling requirement that ERCOT maintain a 13.75% reserve margin. EPA's

²⁵ In EPA's regional compliance scenario, ERCOT was grouped with Southwest Power Pool (SPP) into the "South Central" region, which encompasses the states of Nebraska, Kansas, Oklahoma, Arkansas, Louisiana, and Texas.

modeling predicts more than 10 GW of new natural gas capacity by 2030 in the state compliance scenario, whereas ERCOT's carbon scenarios added 1 to 2 GW of new natural gas capacity.

5. Discussion

Both the survey results and modeling analysis indicate that the environmental regulations evaluated in this assessment are likely to result in retirements of a significant amount of existing generation capacity. The Clean Power Plan will also require significant amounts of generation from renewable sources to meet the proposed CO₂ limits. Both unit retirements and new renewable generation could impact the ERCOT transmission system.

5.1. Impact of Unit Retirements

Resource owners in ERCOT, particularly owners of coal units, will need to take actions to comply with several environmental regulations in the coming years. With the implementation of the Clean Power Plan to consider, resource owners may choose to retire units rather than install the required control technology retrofits to comply with other environmental regulations. Because most of these regulations have compliance dates in the 2016 to 2022 timeframe, there is the potential for a significant number of unit retirements within a relatively short period of time, even without considering the impacts of the Clean Power Plan. If ERCOT does not receive early notification of these retirements, and if multiple unit retirements occur within a short timeframe, there could be implications for reliability.

The accelerated retirement or suspended operations of coal resources would pose challenges to maintaining the reliability of the ERCOT grid. Coal resources provide essential reliability services, including reactive power and voltage support, inertial support, frequency response, and ramping capability. The retirement of coal resources will require studies to determine if there are any resulting reliability issues, including whether there are voltage/reactive power control issues that can only be mitigated by those resources; how to replace frequency response, inertial support, and ramping capability provided by retiring units; and the necessity of potential transmission upgrades, which will be discussed later in this document.

The modeling results indicate that generation from retiring coal capacity will in large part be replaced by increased production from existing natural gas capacity. Compared to the rest of the country, Texas has a robust natural gas infrastructure and is not currently affected by natural gas supply issues. However, the increased use of natural gas nationally could lead to increased market dislocations, such as those seen in the winter of 2013-2014, as well as overall increasing prices and price volatility due to higher gas demand. Depending on the magnitude of these issues, there could be implications for maintaining reliable natural gas supply in the ERCOT region for electric generation in the future.

5.1.1. Unit Retirements without the Clean Power Plan

There are a range of environmental regulations for which resource owners will need to determine compliance strategies in the coming years. Some regulations pose more modest costs and will have limited impacts to generators, while other regulations pose much greater costs. For units facing poor economics in the current market, even modest compliance costs could result in decisions by resource owners to retire units. For others, the cumulative costs of compliance with several regulations may affect resource owners' decisions about whether and how to retrofit their units. Because many of these regulations have compliance dates in the 2016 to 2022 timeframe, there is the potential for a significant number of unit retirements within a relatively short period of time.

The survey responses allow ERCOT to determine the amount of capacity at risk from each regulation at the present time. Figure 8 shows the amount of capacity affected by each of the regulations included on the survey. A unit was counted as affected by each regulation if:

- it has not yet completed necessary modifications for the MATS rule;
- scrubber retrofits or upgrades are required at the unit in EPA's proposed FIP for Regional Haze;
- it is a coal unit without tight SO₂ controls, or a natural gas unit without NO_x controls, and could be affected by CSAPR;
- it reported that it would not be compliant with the 316(b) rule as currently operated; and,
- it reported that actions would be necessary to comply with the ELG or coal ash disposal rule.

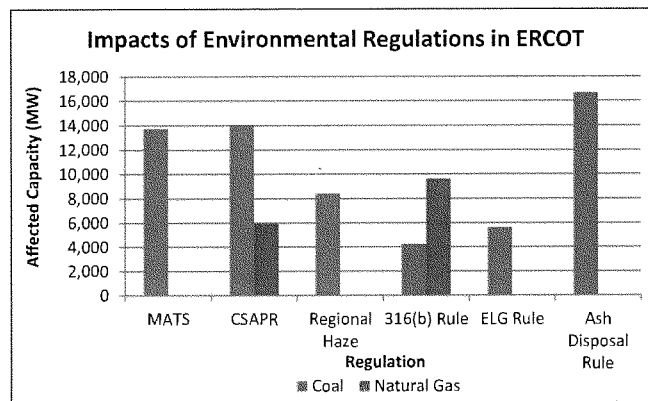


Figure 8: Impacts of Environmental Regulations in ERCOT

As can be seen in Figure 8, coal units are the most affected by environmental regulations. Table 18 shows the cumulative regulatory requirements for surveyed coal capacity based on the combination of applicable regulations for each unit.

Table 18: Cumulative Regulatory Requirements for Coal Units

# of Regulations Significantly* Affecting Unit	# Units	Capacity (MW)	# Units Significantly* Affected by Regulation					
			MATS	CSAPR	Regional Haze	316(b) Rule	ELG Rule	Coal Ash
One regulation	7	5,100	1					6
Two regulations	0	0						
Three regulations	8	3,900	5	8	2	1	2	6
Four regulations	14	8,900	14	11	9	3	5	14
Five or six regulations	3	1,900	3	3	1	3	3	3
Total	32	19,800	23	22	12	7	10	29

*Regulations were counted if compliance requires or would require unit retrofits or if it has the potential to pose significant costs. This does not include potential impacts of the Clean Power Plan

The costs of complying with these environmental regulations vary in their magnitude. Compliance costs include capital costs for the installation of new controls, as well as variable costs for incremental

operations and maintenance activities – including the cost to purchase emissions allowances. Section 2 discussed the potential costs of complying with each environmental regulation considered in this study. The largest capital cost investment will be required to comply with the provisions of the Regional Haze FIP. This cost is an order of magnitude larger than the capital costs associated with other environmental regulations, as shown in Figure 9. Note that these regulations will also pose additional O&M costs, including the price of purchasing emissions allowances under CSAPR. Though not included in Figure 9, increases to generators' O&M costs would also be considered when making decisions to retrofit or retire units.

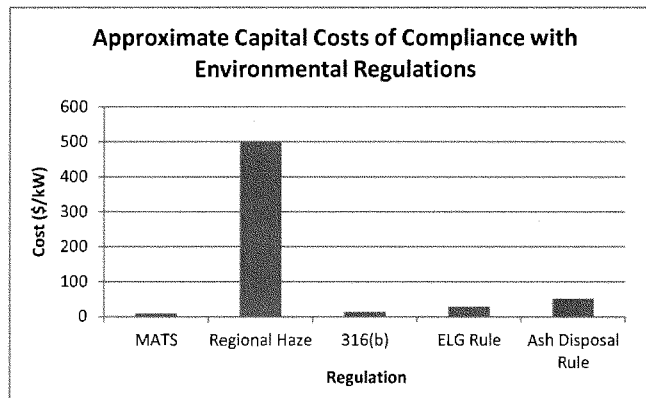


Figure 9: Approximate Capital Costs of Compliance with Environmental Regulations

Combining the information in Table 18 and Figure 9 can provide a rough estimate of the compliance costs faced by coal units in the ERCOT region. Figure 10 shows the cumulative capital compliance costs for coal units. This does not include additional variable costs, or the impacts of the Clean Power Plan.

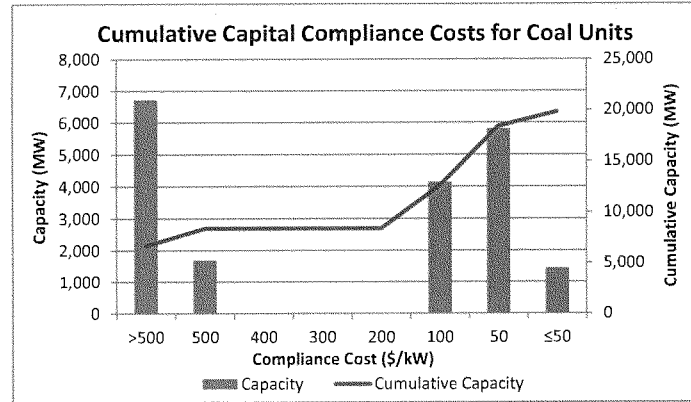


Figure 10: Cumulative Capital Compliance Costs for Coal Units

Based on the information in Figure 10, approximately 8,500 MW of coal-fired capacity in the ERCOT region face cumulative retrofit requirements of \$500/kW or more. Given the magnitude of these costs, it is likely that some of the impacted units will be retired. The bulk of the costs for these units come from the Regional Haze requirements. However, this analysis uses the same capital costs for scrubber upgrades and scrubber retrofits, due to data limitations. The costs faced by units required to upgrade existing scrubbers are likely lower compared to the cost of a scrubber retrofit. Therefore, these units (comprising approximately 5,500 MW of capacity) can be considered to face a more moderate risk of retirement compared to units requiring scrubber retrofits (comprising approximately 3,000 MW of capacity), which face a higher risk.

Additionally, Figure 10 does not include the costs of purchasing emissions allowances under CSAPR, which could range from \$0.75 to \$7.25/MWh, based on ERCOT's modeled emissions prices and depending on the fuel mix and installed controls. Units with weak or no controls would have costs at the upper end of this range. To meet the CSAPR limits in 2015, resource owners may install additional controls, purchase allowances, or mothball affected units on a seasonal basis. Though recent market trends have impacted production from coal generation in the ERCOT region, compliance with CSAPR may have an impact on the economics of certain units. Many of the units facing higher compliance costs for CSAPR would also be affected by the Regional Haze requirements.

ERCOT's modeling analysis assessed the combined impacts of CSAPR and Regional Haze on generation resources. The results predicted 1,200 MW of coal-fired capacity retirements due to CSAPR, and 1,800 MW due to the Regional Haze requirements. This indicates that the combined impact of CSAPR and Regional Haze in ERCOT, as estimated by the model, is 3,000 MW of coal retirements. However, these results likely represent a lower bound on the number of potential coal unit retirements due to the logic used to retire units in the model, generic unit cost information, and the impacts of other environmental regulations. Most notably, the model is not requiring a market rate of return for unit upgrades, but rather a less restrictive positive net present value. Additionally, the modeling does not reflect operational constraints that will impact the ability of resource owners to extract value from their units. For example, increased cycling of coal units would likely result in increased unit outages that would

impact the economics of these units. Given these operational constraints, it is likely that there may be additional coal capacity in the ERCOT region that would also retire due to Regional Haze.

Compared to Regional Haze and CSAPR, the other environmental regulations are expected to affect the economics of at most a small number of units and thus are not expected to have a significant system-wide impact. Coal and natural gas units facing compliance with these other regulations thus have a relatively low risk of retirement. Even so, it is possible that resource owners of units facing poor economics may choose to retire rather than retrofit impacted units. For example, owners of older gas steam units with lower capacity factors may choose to retire the units rather than install controls for the 316(b) rule if significant capital investments are required.

5.1.2. Unit Retirements with the Clean Power Plan

The Clean Power Plan is likely to result in coal unit retirements, due to the need to meet stringent CO₂ emissions limits on a state-wide basis. However, the Clean Power Plan will also impact decisions resource owners make about investments to comply with the other environmental regulations, several of which have compliance deadlines in the 2016 to 2022 timeframe. This raises the potential for a significant number of unit retirements within a relatively short period of time.

As noted in Section 5.1.1, 3,000 to 8,500 MW of coal capacity faces a moderate to high risk of retirement due to the Regional Haze requirements. It is likely that some amount of this capacity would retire, even without considering the impacts of the Clean Power Plan. However, in the context of eventual compliance with CO₂ regulations, retrofitting coal units facing significant compliance requirements becomes less economic. Resource owners may be reticent to make significant capital investments, especially for coal units that are not already relatively well-controlled.

ERCOT's modeling results predicted between 3,300 and 5,700 MW of coal unit retirements incremental to the baseline in the scenarios with CSAPR and the Clean Power Plan. As discussed in Section 5.1.1, ERCOT believes that the modeled retirements represent a lower bound on the number of potential coal unit retirements. ERCOT directed the model to retire capacity at the point when generic operating and fixed costs exceed revenues. However, in the modeling results for the scenarios with the Clean Power Plan, there are several units operating at low revenues and/or low capacity factors that would likely be retired, especially when other non-modeled factors are taken into account. Based on a review of capacity factors and operating revenues for the remaining coal units, ERCOT anticipates the retirement of an additional 2,000 MW of coal capacity and the seasonal mothball of 1,000 MW of coal capacity beyond what is specified in the model output, compared to the CSAPR and \$25/ton CO₂ modeled scenario. These results indicate the overall impact of CSAPR, Regional Haze, the Clean Power Plan, and other environmental regulations to the current coal fleet will be the retirement or seasonal mothballing of between 3,300 MW and 8,700 MW of capacity.

The model also predicted the retirement of 1,300 to 1,600 MW of natural gas steam capacity in the Clean Power Plan scenarios, which is less than the 2,000 MW retired in the baseline scenario. The fewer retirements of natural gas steam units in the carbon scenarios reflects the impact of both the CSAPR and carbon dioxide limits on production from coal units, which improves the economics of natural gas steam units during this period. However, as with coal resources, there are a number of factors that may result in additional natural gas steam unit retirements compared to those found by the model. ERCOT estimates that an additional 1,500 to 4,500 MW of natural gas steam capacity may be at risk of retirement based on low net revenues in the model results combined with the need to comply with the 316(b) rule, CSAPR, and other environmental regulations.

5.2. Impact of Renewables Integration

Integrating new wind and solar resources will increase the challenges of reliably operating the ERCOT grid. In 2013, almost 10% of the ERCOT region's annual generation came from wind resources. To accommodate this level of intermittent generation, ERCOT has needed to evaluate impacts on operational reliability and improve wind output forecasting capabilities. The increased penetration of intermittent renewable generation, as projected by the modeling results, will increase the challenges of reliably operating all generation resources. If there is not sufficient ramping capability and operational reserves during periods of high renewable penetration, the need to maintain operational reliability could require the curtailment of renewable generation resources. This would reduce production from renewable resources, leading to possible non-compliance with the proposed rule deadlines.

Based on the CSAPR and \$25/ton CO₂ scenario, intermittent renewable generation sources will contribute 22% of energy on an annual basis in 2029. However, during 628 hours of the year intermittent generation will serve more than 40%²⁶ of system load. During 128 hours, instantaneous renewable penetration will be higher than 50%, and the peak instantaneous renewable penetration from the model results is 61%. The significant change from present experience is that the highest renewable penetration hours will be driven by maximum solar production during relatively high wind periods. These periods occur during the day (8 a.m. to 5 p.m.), as opposed to early morning hours (usually 2 to 4 a.m.), as currently experienced in the ERCOT region. The high instantaneous renewable penetration hours in 2029 occur year round except for the July-September period. Figure 11 shows generation output by fuel type for the days with the highest instantaneous penetration of renewables in 2029 in the \$25/ton CO₂ scenario.

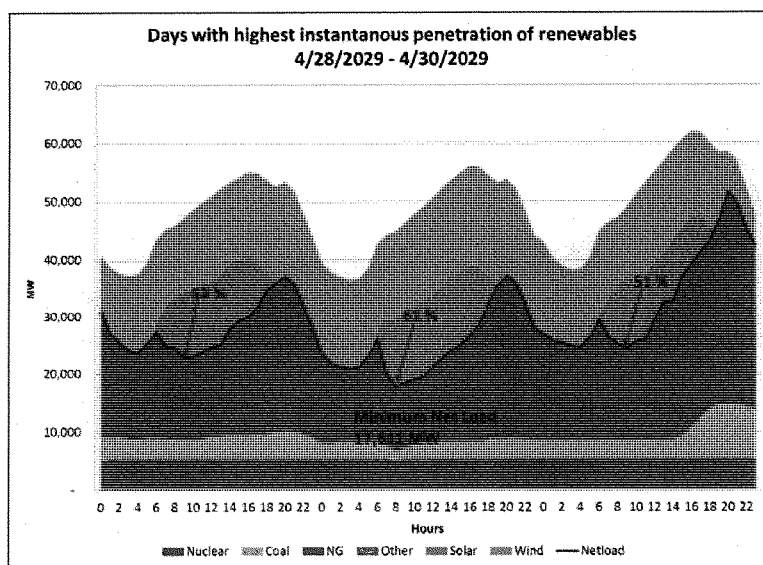


Figure 11: Days with Highest Instantaneous Penetration of Renewables

²⁶ The record in the ERCOT region for wind penetration occurred on March 31, 2014 at 2:00 a.m., when wind resources met 39.44% of load.

Due to load growth, the lowest net load (defined as total load minus generation from intermittent energy resources) in 2029 is higher than the current record (14,809 MW in 2014 and 17,611 MW in 2029). Therefore, during low net load hours there will be no significant change compared to current operating conditions in terms of MW of thermal generation online, inertial response and frequency response available during generation trip events.

Significant increase can be seen in net load ramps compared to current experience. While the net load down ramps in 2029 are still largely defined by decreases in load at night, as is the case currently, the highest net load up ramps are defined by rapid solar production decline at sunset and simultaneous decline in wind production during evening load pick-up. Table 19 displays the maximum ramp-up and ramp-down in 2029 in the \$25/ton CO₂ scenario. Figure 12 shows wind and solar generation output and customer demand (load) on the day with the highest three hour net load ramp in 2029 from the CSAPR and \$25/ton CO₂ scenario.

Table 19: Maximum Ramp-up and Ramp-Down

Net Load	Maximum 60-min Ramp-up (MW/60Mins)	Maximum 60-min Ramp-down (MW/60Mins)	Maximum 180-min Ramp-up (MW/180Mins)	Maximum 180-min Ramp-down (MW/180Mins)
2011 Net Load (actual)	6,267	-6,124	16,058	-18,985
2012 Net Load (actual)	6,563	-7,019	14,997	-15,977
2013 Net Load (Jan-May) (actual)	6,247	-5,446	12,200	-14,373
2029 Net Load (modeled \$25/ton CO ₂ scenario)	11,074	-11,938	22,221	-22,560

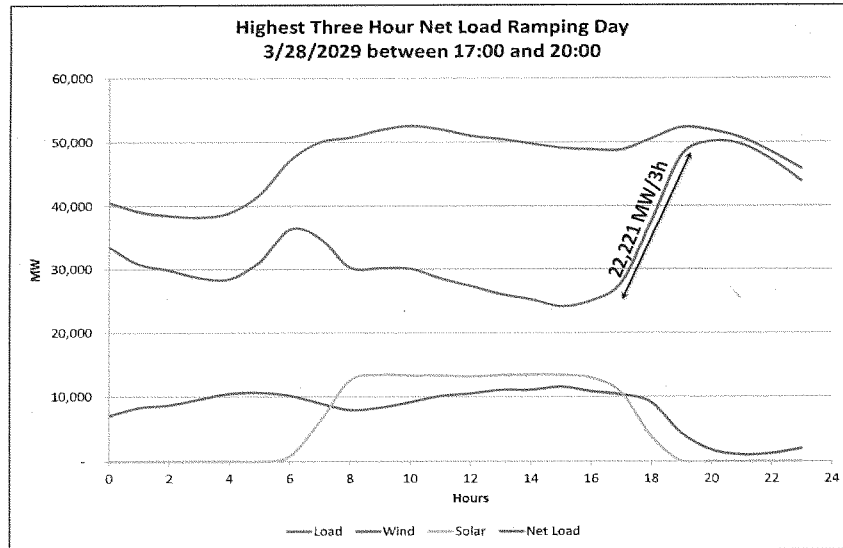


Figure 12: Highest Three Hour Net Load Ramping Day

The simulation model assumes perfect foresight and ensures that there is a sufficient amount of thermal generation with sufficient ramping capability committed to follow such rapid net load ramps. In real time operation, however, accommodating the maximum ramps resulting from simultaneous solar and wind generation decline would be more challenging. At times, the existing and planned generation fleet will likely need to operate for more hours at lower minimum operating levels and provide more frequent starts, stops, and cycling over the operating day. It is important that market mechanisms are adopted so that the need for flexible generation (with short start-up times and high ramping capability) is reflected in real-time energy prices. Market mechanisms to include dispatchable load resources could also help to address flexibility needs. Enhancing wind and solar forecasting systems to provide more accurate wind and solar generation projections will become increasingly important. Regulation and Non-Spinning reserves will need to be increased to address increased intra-hour variability and uncertainty of power production from wind and solar. Tools available to system operators must be enhanced to include short-term (10-min, 30-min, 60-min, 180-min) net-load ramp forecasts and simultaneous assessment of real-time ramping capability of the committed thermal generation to assist operators in maintaining grid reliability.²⁷

Though all solar capacity additions predicted by the model were utility-scale, it is likely that a significant portion of future solar generation capacity will be embedded in the distribution grid (e.g., rooftop solar and small scale utility solar connected at lower voltage levels). ERCOT does not currently have visibility of these resources. To produce accurate solar production forecasts, ERCOT would need to have improved information regarding the size and location of distributed solar installations. Additionally, to ensure grid reliability, there would need to be increased consideration of operational activities on the distribution and transmission systems.²⁸ The PUCT is currently pursuing a rulemaking to improve and expand the data submitted annually to the PUCT on distributed generation facilities.²⁹

Based on ERCOT's modeling, the majority of new renewable generation resource additions are anticipated to be solar. However, if instead ERCOT sees a large amount of wind resource capacity additions, then the reliability impacts may be more severe. Wind production in West Texas results in high renewable penetration during early morning hours, when load is lowest. A larger expansion in wind production relative to solar may result in lower net loads and significant reliability issues. If ERCOT cannot reliably operate the grid with these high renewable penetration levels, then production from these resources will be curtailed to maintain operational reliability. Should this occur, it would reduce production from renewable resources, leading to possible non-compliance with the proposed rule deadlines.

5.3. Impact on Transmission

ERCOT's analysis indicates that the impacts of proposed and recently finalized environmental regulations will result in retirement of legacy base-load generation and development of new renewable generation resources. These changes to the ERCOT generation mix will likely require significant upgrades to the transmission infrastructure of the ERCOT system.

The retirement of a large amount of coal-fired and/or gas steam resource capacity in the ERCOT region would have a significant impact on the reliability of the transmission system. The transmission system is

²⁷ These findings are consistent with an assessment conducted by the North American Electric Reliability Corporation (NERC) and California ISO (CAISO), *Maintaining Bulk Power System Reliability While Integrating Variable Energy Resources*, November 2013. Available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC-CAISO_VG_Assessment_Final.pdf.

²⁸ These findings are consistent with an assessment conducted by the North American Electric Reliability Corporation (NERC) and California ISO (CAISO), *Maintaining Bulk Power System Reliability While Integrating Variable Energy Resources*, November 2013. Available at http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC-CAISO_VG_Assessment_Final.pdf.

²⁹ PUCT Project 42532, *Rulemaking regarding third-party ownership of distributed generation facilities*.

currently designed to reliably deliver power from existing generating resources to customer loads, with the existing legacy resources that are located near major load centers serving to relieve transmission constraints and maintain grid reliability. Retirement of these resources would result in a loss of real and reactive power, potentially exceeding thermal transmission limitations and the ability to maintain stable transmission voltages while reliably moving power from distant resources to major load centers. A significant amount of transmission system improvements would likely be required to ensure transmission system reliability criteria are met even if a moderate amount of coal-fired and gas steam resources were to be displaced. If new natural gas combined cycle resources were to locate at or near retiring coal-fired and gas steam resources, the impact would be lessened.

In the ERCOT region, it takes at least five years for a new major transmission project to be planned, routed, approved and constructed. As such, in order for major transmission constraints to be addressed in a timely fashion, the need must be seen at least five years in advance. Given the competitiveness of the current ERCOT market, unit retirement decisions will likely be made with only the minimum required notification (currently 90 days).

The growing loads in the ERCOT urban centers are causing continued growth in customer demand and a resulting need for new transmission infrastructure. As the units that are at risk of retirement from the proposed rule are located near these load centers, future transmission needs would be increased or accelerated by the likely retirements. For example, a new 345-kV transmission line is currently planned to be in place by 2018 to serve customers in the Houston region, at an estimated cost of more than \$590 million. Long-term studies indicate a potential need for further upgrades in the mid-2020s. The retirement of generation resources within the Houston area prior to 2018 would likely result in grid reliability issues prior to completion of the proposed project. Retirement of generation after 2018 would accelerate the need for additional transmission from the long-term horizon (6-15 years) into the near-term horizon (1-6 years).

Similarly in the San Antonio and the Dallas-Fort Worth regions there are multiple new transmission projects that are being planned to serve existing load growth. At costs of hundreds of millions of dollars, the need for these and similar projects would be accelerated by retirement of legacy fossil fuel-fired units in these regions.

Growth in renewable generation would also likely have a significant impact on transmission requirements. Although ERCOT did not estimate the costs of these transmission infrastructure improvements in this study, recent projects can be illustrative of the potential costs. In early 2014, the transmission upgrades needed to integrate the Texas Competitive Renewable Energy Zones (CREZ) were completed. These upgrades included more than 3,600 miles of new transmission lines, constructed at a cost of \$6.9 billion dollars. The project took nearly a decade to complete. The CREZ project has contributed to Texas' status as the largest wind power producer in the U.S.

While the CREZ transmission upgrades provide transmission capacity beyond current generation development, these new circuits will not provide sufficient capacity to reliably integrate the amount of renewables necessary to achieve the requirements of the proposed rule. Also, if the locations of new renewable generation do not coincide with CREZ infrastructure, further significant transmission improvements will be required. Given the need to increase the amount of renewable resources in order to achieve the proposed compliance requirements in the Clean Power Plan, it is likely that significant new transmission infrastructure would be required to connect new renewable resources.

6. Generation Cost Analysis

The model output included detailed cost information that can be used to characterize the impact of emissions limits on energy prices in ERCOT. This section discusses the cost impacts for each of the

modeled scenarios. All cost figures are reported in nominal dollars, except capital costs, which are in real 2015 dollars.

Table 20 shows the average locational marginal price (LMP) for each scenario in 2020 and 2029, which corresponds to wholesale energy prices. The inclusion of emissions prices resulted in higher average locational marginal prices (LMPs) compared to the baseline scenario. In the CSAPR and \$20/ton carbon price scenario, the average LMP in ERCOT was \$66.17 in 2020 and \$81.13 in 2029 – 34% and 13% above the baseline scenario LMPs for those years, respectively. In the CSAPR and \$25/ton carbon price scenario, the average LMP was \$73.58 in 2020 and \$84.28 in 2030 – 49% and 17% above the baseline scenario estimates. The higher LMPs in the CSAPR and CO₂ limit scenario result from the more frequent occurrence of scarcity hours. Scarcity hours are more frequent in this scenario because of operational constraints resulting from the need to keep CO₂ emissions within the limit. In actual operations, it is likely that there may be more flexibility to meet load than allowed by the model. LMPs are lower in the CSAPR limit and Regional Haze scenario in 2029 because there are fewer scarcity hours, due to the additional natural gas combustion turbines built in this scenario to replace retiring coal capacity.

Table 20: Locational Marginal Prices

Locational Marginal Price	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
2020 LMP (\$/MWh)	\$49.46	\$50.10	\$50.43	\$105.07	\$66.17	\$73.58
2029 LMP (\$/MWh)	\$72.02	\$72.99	\$67.68	\$102.64	\$81.13	\$84.28
2020 LMP % change from baseline	n/a	1	2	112	34	49
2029 LMP % change from baseline	n/a	1	-6	43	13	17
2020 retail energy bill % change	n/a	< 1	< 1	45	14	20
2029 retail energy bill % change	n/a	< 1	-2	17	5	7

As a general estimate, if wholesale power is 40% of the consumer bill, these increases in average LMPs would result in a retail energy price increase of 14% to 20% in 2020, and 5% to 7% in 2029. The increase in wholesale and consumer energy costs compared to the baseline decreases by 2029 due to the addition of new solar capacity, which has virtually no variable costs, and the accrual of energy efficiency savings. The costs of investments in energy efficiency are not estimated in this study. In their comments to the PUCT, EUMMOT estimated the cost of achieving the level of energy efficiency savings estimated by EPA at \$1.6 to \$2.9 billion per year in Texas.³⁰

The LMP reflects the variable cost associated with the generation resource on the margin. Though this measure provides an estimate of wholesale energy prices for consumers, the increase in production costs for generators would differ. Table 21 and Table 22 show generators' variable costs (which include fuel and emissions allowance costs) in 2020 and 2029, respectively. The CSAPR limit scenario results in a small increase in variable costs relative to the baseline, due to the slight shift away from coal toward natural gas. The variable costs in the CSAPR and CO₂ limit scenario reflect the increased cost of natural gas generation, and the effects of energy efficiency and additional renewable generation. The emissions price scenarios result in an increase in variable costs of 28% to 32% in 2020, and 15% to 18% in 2029. This increase is due in large part to the CO₂ emissions price, which in 2029 imposed a cost of \$3.8 billion in the \$20/ton CO₂ scenario and \$4.4 billion in the \$25/ton CO₂ scenario, comprising 19% and 21% of

³⁰ Presentation by Jarrett E. Simon, Director Energy Efficiency, CenterPoint Energy. *PUCT Workshop Project 42636: Comments on Proposed EPA Rule Regarding Greenhouse Gas Emissions for Existing Generating Units*, August 15, 2014. Available from the Public Utility Commission of Texas, Docket 42636, Item 21.

total variable costs for the two respective scenarios. Compared to CO₂ emissions costs, NO_x and SO₂ emissions costs are much smaller, between \$165 and \$200 million in 2020 in the emissions price scenarios.

Table 21: Fuel and Emissions Allowance Costs in 2020

Variable Costs	Baseline	CSAPR Limit	CSAPR and Regional Haze	CSAPR and CO ₂ Limit*	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Total Fuel and Emissions Allowance Costs (billions of dollars)	12.9	13.0	13.0	13.1	16.4	17.0
Total Fuel and Emissions Allowance Costs change from Baseline (%)	n/a	1	1	2	28	32
Average Fuel and Emissions Allowance Cost (\$/MWh)**	30.54	30.74	30.73	31.62	39.58	40.91
CO ₂ Emissions Allowance Costs Only (billions of dollars)	0	0	0	0	3.5	4.1
CO ₂ Emissions Allowance Costs as percent of Total Fuel and Emissions Allowance Costs (%)	0	0	0	0	21	24

*The total fuel and emissions allowance cost cited for the CSAPR and CO₂ limit scenario in the summary report omitted start up and shut down costs. The value has been corrected in this table to include those costs. Start up and shut down costs are also a component of variable costs.

**Average fuel and emissions allowance costs have changed slightly from the values included in the summary report due to a calculation error.

Table 22: Fuel and Emissions Allowance Costs in 2029

Variable Costs	Baseline	CSAPR Limit	CSAPR and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Total Fuel and Emissions Allowance Costs (billions of dollars)	17.7	18.0	18.0	16.8	20.4	20.9
Total Fuel and Emissions Allowance Costs change from Baseline (%)	n/a	2	2	-5	15	18
Average Fuel and Emissions Allowance Cost (\$/MWh)	37.07	37.70	\$37.65	36.60	44.28	45.49
CO ₂ Emissions Allowance Costs Only (billions of dollars)	0	0	0	0	3.8	4.4
CO ₂ Emissions Allowance Costs as percent of Total Fuel and Emissions Allowance Costs (%)	0	0	0	0	19	21

Note that the information in Table 20, Table 21 and Table 22 do not include the associated costs of building or upgrading transmission infrastructure, higher natural gas prices caused by increased gas demand, ancillary services procurement, energy efficiency investments, and potential Reliability Must-

Run contracts. With regard to Regional Haze compliance, these costs do not include the costs of scrubber upgrades or retrofits.

Additionally, there will be capital costs for new generation resources built in both the baseline and emissions scenario cases, shown in Table 23 and Figure 13. Though the baseline and CSAPR limit scenarios add the same amount of new capacity, the costs differ slightly due to differences in the timing of when the new capacity is built by the model. The CSAPR limit and Regional Haze scenario adds 1,900 MW of capacity incremental to the baseline, which results in a 16% increase in capital investments. The scenarios with the Clean Power Plan result in further increases in capital cost investments, increasing by 52% to 77% compared to the baseline. Though not directly reflected in LMPs, these costs will ultimately be reflected in consumers' energy bills.³¹

Table 23: Total Capital Cost Investments by 2029

Capital Costs	Baseline	CSAPR Limit	CSAPR Limit and Regional Haze	CSAPR and CO ₂ Limit	CSAPR and CO ₂ \$20/ton	CSAPR and CO ₂ \$25/ton
Total Capital Cost (billions of 2015\$)	14	15	16	23	22	25
Capital Cost change from baseline (billions of 2015\$)	n/a	1	2	8	7	11
Capital Cost change from baseline (%)	n/a	5	16	59	52	77

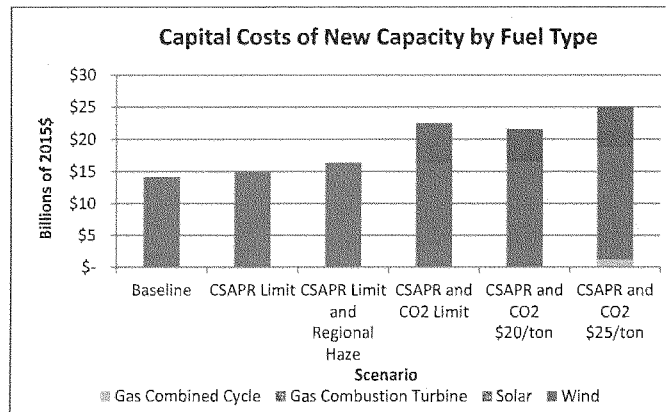


Figure 13: Capital Costs of New Capacity by Fuel Type

As previously described, the modeling results show a decrease in the ERCOT reserve margin in the early years of the Clean Power Plan compliance timeframe. In a recently completed report prepared for the PUCT, the Brattle Group quantified the cost to consumers associated with periods of reduced reserve

³¹ The LMP is based on the variable costs of the last unit cleared in the market to serve the last MW of load. Units that clear the market with variable costs below the LMP recover capital and fixed costs through the difference between their variable costs and the LMP. Accordingly, because the LMP contributes to consumer energy bills, those capital costs are ultimately paid by consumers.

margins.³² These costs include a range of production costs, including the cost of emergency generation, the cost of utilizing interruptible customers, the costs of utilizing all of the available ancillary services, and the impact to consumers from firm load shedding, all of which increase at lower reserve margins. As an example, the retirement of 6,000 MW of generation capacity would be expected to reduce the system reserve margin by about 8%. Based on this report, if this capacity change occurred when the system reserve margin was approximately 14%, the increased annual system costs at the resulting 6% reserve margin would be approximately \$800 million higher than would be expected prior to the regulatory impact.³³

Finally, ERCOT used the same natural gas price assumptions in all of the modeled scenarios. As noted previously, with the increased consumption of natural gas anticipated not only in ERCOT but nationally with the implementation of the Clean Power Plan, natural gas prices could increase beyond the levels anticipated in this modeling analysis. This would pose additional costs to consumers, which are not reflected in this study.

7. Conclusion

The results of this study indicate that the Regional Haze program and the Clean Power Plan will both lead to the retirement of coal-fired capacity in ERCOT. EPA's proposed Regional Haze FIP is likely to result in the retirement of coal units due to the costs associated with upgrading and retrofitting scrubbers. ERCOT anticipates that 3,000 MW to 8,500 MW of coal-fired capacity in ERCOT face a moderate to high risk of retirement due to these requirements. If implemented as proposed, the Clean Power Plan will also result in coal unit retirements, due to the need to meet stringent CO₂ emissions limits on a state-wide basis. ERCOT's analysis suggests that the Clean Power Plan, in combination with other environmental regulations, will result in the retirement of up to 8,700 MW of coal-fired capacity. By comparison, the other regulations are not expected to have a significant system-wide impact, but could affect the economics of a small number of units.

The retirement of existing capacity in ERCOT could result in localized transmission reliability issues due to the loss of fossil fuel-fired generation resources in and around major urban centers, and will strain ERCOT's ability to integrate new intermittent renewable generation resources. If the expected retirement of coal resources were to occur over a short period of time, reserve margins in the ERCOT region could reduce considerably, leading to increased risk of rotating outages as a last resort to maintain operating balance between customer demand and available generation. The need to maintain operational reliability (i.e., sufficient ramping capability) could require the curtailment of renewable generation resources. This would limit and/or delay the integration of renewable resources, leading to possible non-compliance with the proposed Clean Power Plan deadlines. These issues highlight the need for the Clean Power Plan to include a process to effectively manage electric system reliability issues, along the lines of the ISO/RTO Council (IRC) proposal for the inclusion of a reliability safety valve process.

The Clean Power Plan will also result in increased energy costs for consumers in the ERCOT region. Based on ERCOT's modeling analysis, energy costs for consumers may increase by up to 20% in 2020, without accounting for the associated costs of transmission upgrades, higher natural gas prices caused by increased gas demand, procurement of additional ancillary services, energy efficiency investments,

³² The Brattle Group. *Estimating the Economically Optimal Reserve Margin in ERCOT*, January, 2014. Available at http://interchange.puc.texas.gov/WebApp/Interchange/application/dbapps/filings/pgSearch_Results.asp?TXT_CNTR_NO=40000&TXT_ITEM_NO=649.

³³ See Figure 22 of the Brattle Group report (page 48).

capital costs of new capacity, and other costs associated with the retirement or decreased operation of coal-fired capacity in ERCOT. Consideration of these factors would result in even higher energy costs for consumers. Though the other regulations considered in this study will pose costs to owners of generation resources, they are less likely to significantly impact costs for consumers.

At this time, there is uncertainty regarding the implementation of environmental regulations, particularly the Clean Power Plan. Once EPA finalizes these regulations and pending litigation is resolved, resource owners will need to make decisions about their generation units that could result in reliability and transmission constraints. As new information becomes available, ERCOT will continue to analyze the impacts of regulatory developments that may affect the ability to provide reliable electricity to consumers in Texas.

Appendix A: Unit Emissions and Control Technologies

As discussed in Section 3, the generator environmental survey asked resource owners to report currently installed control technologies and average NO_x , SO_2 , and CO_2 emission rates. These responses identify potential compliance risks associated with the pending implementation of CSAPR, the Regional Haze program, and CO_2 regulations. This Appendix discusses the control technologies used in ERCOT for SO_2 and NO_x emissions, and the survey responses pertaining to this information.

Emissions of SO_2 are primarily a concern for coal-fired capacity because the combustion of natural gas emits very low amounts of SO_2 . Figure A-1 compares the reported SO_2 emission rates for different types of generation. Coal units may use scrubbers to remove SO_2 from air emissions. Scrubbers vary in their efficiency at removing SO_2 . The most efficient scrubbers in the ERCOT coal fleet remove 90 to 99% of SO_2 from air emissions, while others have removal efficiencies in the 60 to 70% range.

Another way to reduce SO_2 emissions is through changes to a unit's fuel mix. Emissions of SO_2 vary with sulfur concentrations in the coal; some coal types have lower sulfur content than others. In ERCOT, coal-fired generators use either Powder River Basin (PRB) coal imported from the Western U.S. or locally mined lignite coal, or a mix of the two coal types. PRB coal has much lower sulfur content compared to lignite, so using PRB coal can, to some extent, help limit SO_2 emissions. Most coal units in ERCOT control their emissions through the use of scrubbers, a fuel mix that contains PRB coal, or both.

Based on the survey responses, 70% of coal capacity in ERCOT utilizes scrubbers to remove SO_2 , while 82% of coal capacity uses some amount of PRB coal in their fuel mix. The most tightly controlled units in ERCOT use scrubbers with high SO_2 removal efficiencies in combination with PRB coal. Table A-1 summarizes the SO_2 control strategies used by coal-fired generation in ERCOT.

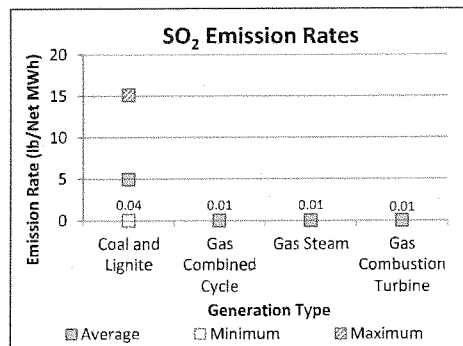
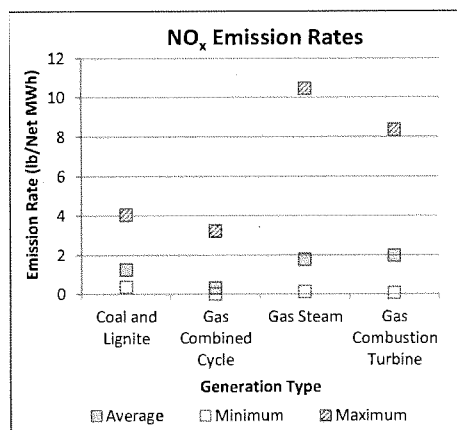


Figure A-1: Average SO_2 Emission Rates

Table A-1: Coal Unit SO_2 Controls and Fuel Mix

SO_2 Controls and Fuel Mix	# Units	Capacity (MW)	% of Surveyed Coal Capacity
Scrubber			
Yes	20	13,800	70%
No	12	6,000	30%
Fuel Mix			
100% PRB	14	8,600	43%
PRB/Lignite mix	11	7,600	39%
100% Lignite	7	3,600	18%

NO_x emissions are relevant for both coal and natural gas-fired capacity. Figure A-2 shows the NO_x emissions rates reported by fuel type. Options for NO_x controls include selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), or NO_x combustion controls. SCR systems provide the tightest controls for NO_x emissions; 35% of surveyed coal capacity and 34% of surveyed natural gas capacity reported using this technology. Table A-2 summarizes the installed NO_x control technologies in the ERCOT fossil fleet.

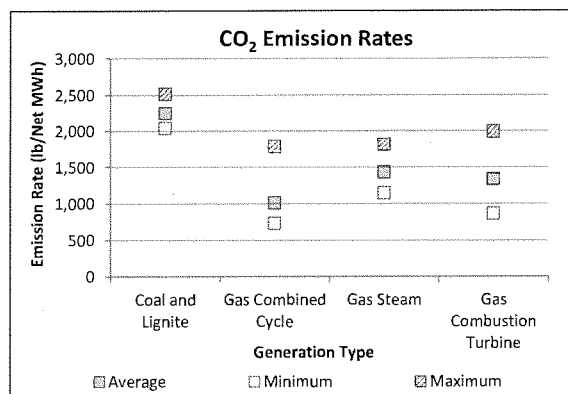
Figure A-2: Average NO_x Emission RatesTable A-2: Unit NO_x Controls

NO _x Controls*	# Units	Capacity (MW)	% of Surveyed Capacity of Fuel Type
<i>Coal unit NO_x Controls</i>			
SCR	10	7,000	35%
SNCR	6	3,700	18%
NO _x Combustion Controls	23	18,900	95%
Other	1	700	3%
<i>Natural gas unit NO_x Controls</i>			
SCR	100	16,700	34%
SNCR	0	0	0%
NO _x Combustion Controls	203	30,900	63%
Other	10	1,600	3%

*Some units use multiple NO_x control strategies

Units that have good SO₂ and NO_x controls will likely face lower compliance costs under CSAPR or future air emissions regulations. Those units with poor or no controls, particularly coal units, are more likely to incur significant compliance costs under upcoming environmental regulations.

There are no currently available emission control technologies for CO₂ emissions other than carbon capture and storage, though efficient operation of units can reduce CO₂ emissions rates. CO₂ emissions rates are the highest for coal-fired units and lowest for natural gas combined cycle units, as shown in Figure A-3.

Figure A-3: Average CO₂ Emission Rates



Granddaddy Mountain, Granddaddy Mountain Park in Texas
View southwest from the end of Wilderness Ridge looking across the mouth of McKittrick Canyon
Credit: National Park Service

COMMENTS OF
LUMINANT GENERATION COMPANY LLC



EPA's Proposed Partial Disapproval of Texas and
Oklahoma Regional Haze State Implementation
Plans and Proposed Federal Implementation Plans

Docket EPA-R06-OAR-2014-0754
79 Federal Register 74,818 (December 16, 2014)

SUBMITTED APRIL 20, 2015

FOREWORD

The Environmental Protection Agency's regional haze proposal for Texas and Oklahoma goes far beyond the agency's authority under the Clean Air Act. There is no legal or technical basis for EPA's proposed federal implementation plan ("FIP") since the state implementation plan ("SIP") submitted by Texas fully complies with the statute and all regulatory standards.

The Clean Air Act's regional haze program is about making reasonable incremental improvements to visibility at national parks and certain other federal areas—it's not about what is purported to be technologically possible or achieving alleged potential health benefits. Here, even though the visibility goals EPA proposes for Texas and Oklahoma are already being met—as evidenced by real-world monitoring data—EPA's proposal would require Texas to spend \$2 billion for what EPA projects would be *no* perceptible improvement in visibility.

EPA should withdraw its proposal and instead fully approve Texas's and Oklahoma's regional haze plans.

The Clean Air Act's regional haze program requires states to work cooperatively to develop state plans that achieve reasonable progress toward the goal of improved visibility in national parks and other federally protected areas (called "Class I areas"). To comply, Texas worked with neighboring states over a multi-year period to model and project haze impacts, review state emissions, and develop coordinated plans to achieve reasonable progress.

Texas and its neighbors, including Oklahoma, consulted on the emission reductions that each would include in its plan to improve visibility in the federal areas in each state. These plans are working. As confirmed by recent monitoring data, Texas and its neighbors have already achieved substantial progress in improving visibility, and, in fact, visibility improvements have surpassed even the most aggressive projections and goals.

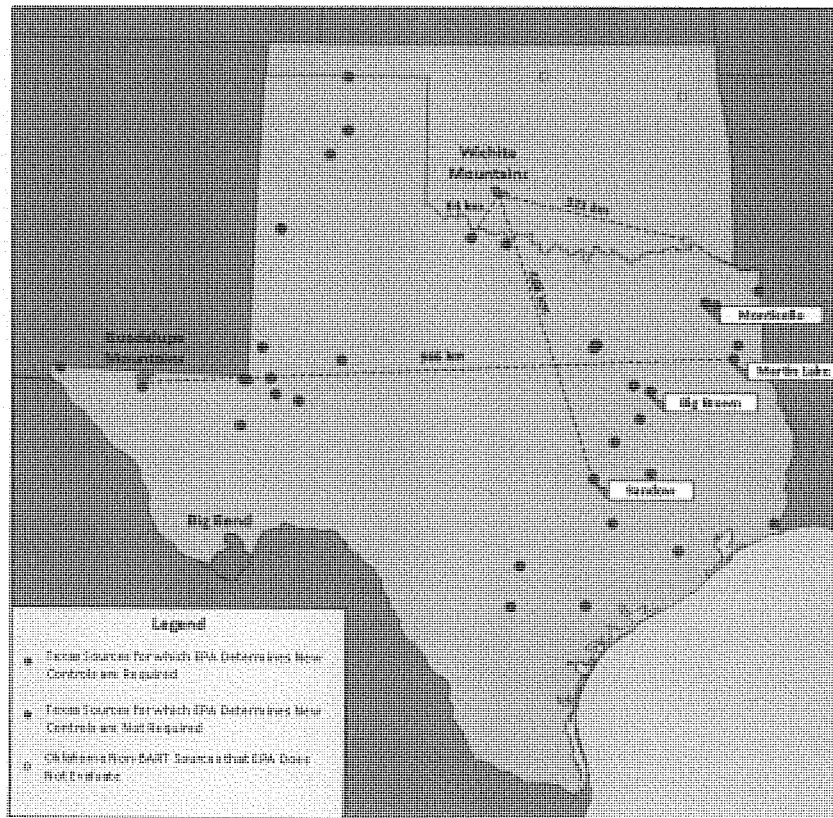
Yet EPA now brushes aside this cooperation among states and disregards the substantial improvements that have been achieved. Instead of using the same objective criteria and standards applied to every other state's regional haze plan, EPA inexplicably created standards out of whole cloth to review the Texas and Oklahoma plans.

The proposal burdens a handful of Texas generating units, located far away from these Class I areas, with massive costs that would threaten their continued operation and economic viability and the thousands of jobs they provide.

To arrive at this conclusion, EPA invents a methodology found nowhere in the statute or regulations and applies it in a seemingly random manner. The map below depicts EPA's skewed and unprecedented approach for Texas, with sources far away from these federal areas somehow being captured by EPA's novel



methodology, while closer sources are excluded. There is no discernible rationale for this flawed approach.



Never before has EPA singled out individual sources using the new approach that EPA employs here to derail the regional haze plans by Texas and Oklahoma. The record is irrefutable that EPA has routinely approved other states' regional haze plans that look just like the Texas plan and achieved the same level of progress.

With this unprecedented approach, EPA resorts to stretching the science and the law beyond all recognition to justify its preordained result. EPA fails to follow its own modeling protocols or to validate its modeling, and it uses results well outside the model's well-recognized limitations.

Further, EPA's legal analysis ignores the criteria that Congress included in the statute and relies

instead on criteria that Congress did not include. Ignoring its own regulations, EPA offers newly minted "interpretations" that bear no resemblance to the plain language of the regulations themselves. Tellingly, EPA's proposal begins not by offering a plausible reading of its regulations, but by explaining why it thinks this new approach to Texas is beyond the review of a federal court. This is the opposite of reasoned decision-making.

Perhaps the most glaring problem with EPA's alternative is that it would produce no perceptible changes in visibility beyond what Texas's plan achieves in this planning period, but at a cost of approximately \$2 billion more. The vast majority of these costs, EPA concedes, are for measures that cannot even be implemented by the interim goal of 2018 and are thus outside the agency's authority to impose in the first place.

The regional haze program is not a health-based program that requires emission reductions at any cost and on any schedule conceived by EPA, but instead is a program designed to achieve reasonable incremental improvements in visibility at specific areas over a long-term horizon. Yet EPA's replacement proposal for Texas would not achieve any noticeable visibility improvements in the three Class I areas in Texas and Oklahoma.

Visibility is measured in deciviews. Anything less than one deciview generally can't be perceived by the human eye. As the table below shows, EPA's alternative would, under EPA's own estimate, result in imperceptible changes in visibility measured in tenths and hundredths of a deciview.

EPA'S PROPOSAL ACHIEVES NO DISCERNABLE IMPROVEMENT

Class I Area	State Established Goal (2018) (20% worst days)	EPA Proposed Goal (2018) (20% worst days)	Difference Between State Goal and EPA Proposed Goal
Big Bend (TX)	16.60 dv	16.57 dv	0.03 dv
Guadalupe Mountains (TX)	16.30 dv	16.26 dv	0.04 dv
Wichita Mountains (OK)	21.47 dv	21.33 dv	0.14 dv

In other words, EPA would force **\$2 billion** in costs on a few Texas companies in hopes of achieving imperceptible improvements in visibility.

Although no one will discern the difference from EPA's proposal, every person in Texas will be exposed to increased costs of electricity and risks to reliability. There is no form of cost-benefit analysis that could justify such an approach, and, unsurprisingly, EPA does not even try to offer one.

None of this debate is necessary. The Texas regional haze SIP has been in place since 2009, and it is working. Texas emissions have decreased, and visibility has improved—beyond what even EPA would require in this proposal. Based on data from EPA's own visibility monitors at these three Class I areas, visibility has *already* improved to levels *better than* EPA asserts is necessary by 2018.

The table below shows actual monitored visibility at these areas, compared to the goal that EPA claims must be achieved by 2018.

EPA'S OWN MONITORS SHOW REASONABLE PROGRESS HAS ALREADY BEEN ACHIEVED

Class I Area	Actual Observed Conditions from EPA's IMPROVE Monitors (2009-13) (5-year average) ¹	EPA's Proposed Goal (2018)
Big Bend (TX)	16.3	16.57
Guadalupe Mountains (OK)	15.3	16.26
Wichita Mountains (OK)	21.2	21.33

While EPA relies on computer modeling, actual real-world data clearly and irrefutably demonstrate the effectiveness of the Texas plan. These improvements are the result of on-going emission reductions that will continue under Texas rules and national programs like the Cross-State Air Pollution Rule (CSAPR) and the Mercury and Air Toxics Standard (MATS)—all without the additional \$2 billion that EPA would require.

EPA ignores these data from its own monitors and even refuses to account for CSAPR and MATS limitations in the modeling it uses to justify its proposal. But the reality remains the same—Texas's plan is working and visibility is improving. EPA should withdraw its FIP and approve the Texas SIP.

¹ 79 Fed. Reg. 74,818, 74,843, 74,870 (Dec. 16, 2014).

Visit the following website for the full report <https://www.energyfutureholdings.com/wp-content/uploads/2015/04/LuminantRegionalHazeEPAComments.pdf>

Testimony of Steven Pirner, PE
Secretary, South Dakota Department of Environment and Natural Resources
to the
U.S. Senate Committee on Environment and Public Works

**“Cooperative Federalism: State Perspectives on EPA Regulatory Actions and
the Role of States as Co-Regulators.”**

March 9, 2016
Washington, D.C.

Chairman Inhofe, Ranking Member Boxer, and Members of the Committee, my name is Steve Pirner, Secretary of the South Dakota Department of Environment and Natural Resources (DENR). I appreciate the opportunity to share with you our perspectives on why we do not believe the current regulatory framework between EPA and the states upholds the principle of cooperative federalism.

To help fund the administration of federal regulatory programs, EPA awards us a Performance Partnership Grant. In 2012, the grant peaked in funding, but has declined during the last next three years. This decrease is certainly inverse to the huge increase in federal requirements for delegated programs, and in our view, is an erosion of cooperative federalism.

An increase of federal preemption on what we hold as states' rights is also detrimental to cooperative federalism. For example, EPA and the Corps of Engineers developed a rule intending to clarify which waterbodies are subject to jurisdiction under the Clean Water Act. The rule has faced substantial opposition in South Dakota and we joined a lawsuit with 12 other states to block the rule. Upon joining the challenge, South Dakota Attorney General Marty Jackley was quoted as saying, *“The EPA is overstepping its Congressional authority and seizing rights specifically reserved to the states.”*

Also under the Clean Water Act, EPA has proposed or finalized new national water quality and effluent standards for ammonia, nutrients, selenium, and dental offices. The

bottom line is that these new, more stringent standards are going to cause additional wastewater treatment which is going to drive wastewater treatment costs up, perhaps to the point of being cost prohibitive.

Under the Resource Conservation Recovery Act, EPA finalized regulations to regulate coal ash. This was prompted by the liquid coal ash spill in Tennessee. Our single coal-fired plant, the Big Stone Power Plant, disposes of only dry ash, but it is still subject to the new rules which preempt DENR's existing solid waste permit.

In a settlement agreement under the Clean Air Act between EPA and the Sierra Club, the Big Stone Plant was listed as a large source and needing to demonstrate compliance with EPA's 1-hour sulfur dioxide standard. EPA never took into account the new air pollution controls installed at a cost of \$384 million to meet the Regional Haze Rule. There is no doubt these new controls will reduce sulfur dioxide emissions below the thresholds established in the consent decree.

Another Clean Air dispute involves ozone. South Dakota is one of only ten states in the nation that is in full attainment with the national ambient air quality standards, but against our recommendations, EPA adopted a new, lower standard for ozone. We are now at risk of having a non-attainment status; not because our air has gotten dirtier, but because EPA lowered the standards potentially below our background levels.

In response to another petition from the Sierra Club, EPA determined that certain startup, shutdown, and malfunction exemptions in 36 states, to include South Dakota, are inadequate under the Clean Air Act and need to be eliminated. Our exemption allows for brief periods of visible emissions because certain pieces of equipment are not fully functional when these events take place. DENR's rule was first established in 1975, was approved by EPA, and has not caused or interfered with South Dakota staying in full compliance with the National Air Quality Standards. South Dakota has joined Florida's lawsuit against the rule along with 15 other states.

The final rule that highlights the lack of cooperative federalism is the carbon dioxide standard for existing power plants. In 2012, 74 percent of the power generated in South

Dakota already came from renewable sources. In spite of this remarkable record, EPA's rule threatens the economic viability of the two fossil fuel fired power plants and could strand the Regional Haze controls previously mentioned at the Big Stone Power Plant. Here again, our Attorney General has joined lawsuits against the rule, most notably with West Virginia.

The bottom line is these new federal requirements will have a huge impact on our citizens and economy, but will produce little or no noticeable benefits in South Dakota. For this reason, each state should have the right and the freedom to address these issues individually, using the principles of cooperative federalism and Executive Order 13132 on Federalism. As stated in the Executive Order, *"The Framers recognized that the states possess unique authorities, qualities, and abilities to meet the needs of the people and should function as laboratories of democracy."* That is not the case now.

I hope this information is useful to the committee. Thank you again.

April 20, 2015

Mr. Guy Donaldson, Chief
Air Planning Section (6PD-L)
Attn Docket ID No.: EPA-R06-OAR-2014-0754
Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Submitted via www.regulations.gov

Re: Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility; Proposed Rule, 79 Fed. Reg. 74,818 (Dec. 16, 2014); Docket ID No. EPA-R06-OAR-2014-0754

Comments of San Miguel Electric Cooperative, Inc.

To Whom It May Concern:

San Miguel Electric Cooperative, Inc. (hereinafter referred to as San Miguel) appreciates the opportunity to comment on the U.S. Environmental Protection Agency's (EPA), Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility; Proposed Rule, 79 Fed. Reg. 74,818 (Dec. 16, 2014); Docket ID No. EPA-R06-OAR-2014-0754 (hereinafter referred to as "Proposed FIP").

San Miguel is a rural electric Generation and Transmission Cooperative formed in 1977 to provide electric generation. As a not-for-profit cooperative San Miguel is fully owned by its consumer members, a majority of consumer-members are rural residential users. The cost of electricity is of great concern to San Miguel and its consumer members.

The principal business of San Miguel is the production of electric energy in South Central Texas. San Miguel operates only one power generation facility, which includes one (1) lignite-fired power plant and one (1) lignite mine in South Central Texas. This lignite-fired power plant has a net capacity of 391 Megawatts and is a base load unit. The generating unit fires only lignite provided by the lignite mine. This one lignite-fired unit comprises 100% of SMEC's generating capacity and average yearly output is 2.9 million megawatt hours. San Miguel is a small business as defined by the FERC.

San Miguel has a significant interest in the outcome of this rulemaking. San Miguel's lignite fired electric generating facility is a major source of electrical generation to our member cooperatives, under long term wholesale power contracts for 100% of the generation of the San Miguel Generating Station. Being a not-for-profit cooperative, San Miguel will be forced to pass along, to its consumer-owners, all costs of meeting any new requirements that may result from the implementation of the Proposed FIP.

As a member-owned electricity supplier, San Miguel understands that reliable, affordable electricity has been one of the key drivers of economic growth and prosperity in this country. This fact must not be forgotten as the EPA makes decisions on whether and how to regulate Regional Haze in Texas.

Comments

San Miguel is separating its comments into two sections:

- I. Proposed Reasonable Progress and Long-Term Strategy Determination for San Miguel
- II. Other Comments

I. Proposed Reasonable Progress and Long-Term Strategy Determination for San Miguel

As an initial matter, San Miguel does not believe that it should be included as one of the 15 electric generating units ("EGUs") with a proposed SO₂ limit.¹ EPA, as part of its additional visibility analysis in its FIP TSD document, narrowed the list of sources for additional analysis. San Miguel was identified as having a modeled impact of 0.207% on the most-impacted area (based on estimated unit average extinction percentage impacts on the worst 20% of days for class I areas), as represented on page A-51 of the FIP TSD document. This is below EPA's own 0.3% threshold that EPA used to identify sources for further evaluation. Rather, EPA appears to include San Miguel for further analysis based on the "estimated facility impact adjusted to reflect 2008-2012 average emissions," that demonstrate a 0.333% impact. However, as the model reflects, emissions going forward for San Miguel should be far below those levels and below EPA's 0.3% threshold. Given that EPA's modeled projected impact for San Miguel is below EPA's level for additional visibility analysis, and the continued reduction in emissions from the

¹ As discussed in Section II of this letter, San Miguel believes that the Proposed FIP should be withdrawn and that EPA should approve of Texas' SIP submission. Nothing in this comment letter should be construed as an endorsement of this Proposed FIP, though San Miguel does include the following substantive comments if EPA intends to proceed despite this opposition.

San Miguel plant with its upgraded scrubber, EPA should completely remove San Miguel from the list of units with source-specific limits.

San Miguel appreciates that the EPA has seen that San Miguel has been proactive in improving its SO₂ scrubber system to operate at the highest level. San Miguel also appreciates EPA's understanding that the lignite burned from the San Miguel Mine has a naturally occurring and varying sulfur content. EPA has further recognized that San Miguel is using the best technology available to remove sulfur at the highest level expected. Thus the EPA has not proposed any further control for San Miguel.

The EPA has specifically solicited comments on the proposed SO₂ emission limit for San Miguel and the potential need for a higher limit to provide sufficient operational headroom. In response, San Miguel believes that a higher limit and an annual emission limit is necessary to provide operational headroom to demonstrate compliance.

San Miguel is a mine mouth plant. Its only source of fuel is the lignite that is delivered to the plant directly from the San Miguel Lignite Mine. This fuel varies significantly in its heating value and sulfur content depending on the lignite seam and mining geographic location. The lignite delivered is a blend of three seams of lignite from two geographical separated areas in the mine. Each area and each seam has its own unique qualities - sulfur and heating value. The mine attempts to provide a fuel that provides the specified heating value for the lignite designed steam generator. The mining areas have moved approximately 14 miles since San Miguel started commercial operation in 1982. The sulfur in the lignite has varied as the mine as mining operations have moved. Table 1 shows how sulfur and heating value vary over the past 14 years and how these two values determine the inlet quantity of SO₂ into the wet flue gas scrubber system. Table 1 is referenced as Attachment A to this document. It has been separately hand-delivered to EPA's Region 6 office as it contains Confidential Business Information.

The equivalent SO₂ is the inlet SO₂ loading to the scrubber system. This value is directly related to the amount of SO₂ that can be removed by the scrubber system.

Table 2 shows the relationship between actual annual emission rate and the calculated emission limit based on a 94% removal rate of the average fuel. Modifications to the scrubber have increased efficiency from 90% in the early 2000's to the current maximized efficiency of 94%.

In the discussion of long term strategy for San Miguel the EPA stated: "We believe that based on the scrubber upgrades it has recently performed and its demonstrated ability to maintain an emission rate below this value on a monthly basis from December 2013 to June 2014 that it can consistently achieve this emission level." While it is true that San Miguel did achieve the emission level discussed in the Proposed FIP, this is not typical of San Miguel's operations and was due to outstanding events that contributed to achieving that emissions rate. During that time period: 1) San Miguel was only operating for 3,332 hours out of the possible 5,064 hours; 2) San Miguel, a base load unit, operated only one out of the seven months as a base load unit during

that time period. These changes in operations were due to economic and other external factors and are at variance with long-time historic operations so they should be considered an exception, not the norm of our operations for purposes of assessing long-term compliance feasibility. For example, during all other months of 2014 San Miguel was operating in a load following mode, cycling between full load and minimum load.

When San Miguel returns back to operating as a base load unit, the emission limit will be unachievable, especially during the peak summer months. A higher limit in combination with a limit based on an annual average, rather than the proposed 30 day rolling emission average, will help to address these concerns.

Another reason the limit should be increased is due to variations in the sulfur content and heat-rate of the lignite. As demonstrated in Table 2, when the sulfur content of the fuel was at its peak from 2009 through 2011, and the scrubber operating at 94% efficiency, the limit could not be met. This indicates a higher limit would be necessary to demonstrate compliance.

Table 2
Actual vs Calculated Emission Rate

Year	Inlet SO2 lbs/mmBtu	Calculated Emission Rate lbs/mmBtu	Actual Emission Rate lbs/mmBtu	Actual Months
				Average Emissions Above 0.6 lbs/mmBtu
2000	7.386	0.443	0.68	8
2001	8.237	0.494	0.746	11
2002	8.721	0.523	0.731	11
2003	7.483	0.449	0.531	1
2004	7.623	0.457	0.486	2
2005	7.551	0.453	0.733	9
2006	9.040	0.542	0.657	10
2007	9.408	0.564	0.496	3
2008	9.983	0.599	0.581	7
2009	10.152	0.609	0.628	7
2010	10.635	0.638	0.62	8
2011	10.417	0.625	0.607	6
2012	9.616	0.577	0.621	6
2013	9.138	0.548	0.581	4
2014	8.669	0.520	0.482	0

Again, 2014 was an aberration and not in line with San Miguel's historic operations. EPA should, therefore, raise the emissions limit to reflect the actual operation of the San Miguel facility, while also increasing the averaging period to one year, rather than the currently proposed

30-day rolling average. We understand that EPA has voiced a preference for shorter averaging periods due to seasonal variations of emissions and visibility impacts. However, since San Miguel is a base load unit and intends to operate year-round, these concerns are minimized. That being said, if EPA does intend to proceed with a 30-day rolling SO₂ emissions limit, San Miguel's limit should be raised to an even higher level than discussed above. This would account for fuel variability leading to higher than normal emissions over a period of time greater than 30 days.

Other Comments

San Miguel is an active member of the Gulf Coast Lignite Coalition (GCLC). San Miguel refers to, and fully supports the more expansive comments submitted by GCLC in this rulemaking.

GCLC comment letter explains why the EPA's proposed disapproval of key components of Texas' SIP, and its proposal of a federal implementation plan ("FIP") is without basis, is without prior precedent, and unfairly targets and burdens Texas sources. Specific topics covered in the GCLC comments are:

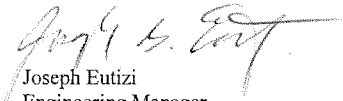
- EPA may not supplant Texas' SIP with what EPA believes is a *more* reasonable FIP
- EPA is unlawfully attempting to double-burden sources already complying with BART requirements and attempts to apply beyond-BART requirements to sources that are explicitly exempted from single-source BART requirements
- Texas' reasonable progress analysis and associated SIP submission complies with all CAA requirements and must be approved
- Texas' long-term strategy and associated SIP submission complies with all CAA requirements and must be approved
- Every factor of EPA's proposed reasonable progress analysis fails
- EPA has violated its regional consistency regulations by applying different and more stringent standards on Texas units compared to other states and regions
- EPA may not issue this FIP prior to providing Texas the opportunity to submit a SIP responsive to EPA's determination that Texas' 2009 SIP submission was inadequate
- EPA's Regional Haze FIP is not a rule of "nationwide scope and effect."

Conclusion

San Miguel appreciates the opportunity to comment on the Proposed FIP and encourages the EPA to withdraw the Proposed FIP and allow Texas to continue with its implementation of the Texas SIP. If EPA continues with the Proposed FIP, San Miguel requests the EPA remove San Miguel from the list of EGUs with source-specific SO₂ emissions limit. Further, if EPA maintains San Miguel's inclusion on that list of EGUs, San Miguel respectfully requests that

EPA increase the San Miguel emission limit and increase average period to an annual average to insure the limit and average period appropriately reflect base load operations and periods when the sulfur in the fuel increases to elevated levels, as was the case between 2009 and 2011. If you have any questions or require additional clarification please contact Joseph Eutizi at 830-784-3411.

Sincerely,



Joseph Eutizi
Engineering Manager
San Miguel Electric Cooperative

ATTACHMENT A – TABLE 1

CONFIDENTIAL BUSINESS INFORMATION – HAND DELIVERED



Parker McCullough, Chair • Neal Walker, Vice Chair • John W. Fainter, President & CEO • Walton L. Baum, Executive Vice President • Christopher Miller, Corporate Secretary
April 20, 2015

By email to R6_TXOKRegionalHaze@epa.gov,
and by mail

Mr. Guy Donaldson
Chief, Air Planning Section (6PD-L)
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Attn: Docket No. EPA-R06-OAR-2014-0754

Re: Comments of the Association of Electric Companies of Texas regarding EPA's proposed partial disapproval and partial approval of the Texas Regional Haze State Implementation Plan and proposed Regional Haze Federal Implementation Plan for Texas; 79 Fed. Reg. 74818 (December 16, 2014); Docket No. EPA-R06-OAR-2014-0754

Dear Sir or Madam:

The Association of Electric Companies of Texas ("AECT") appreciates the opportunity to submit these comments regarding EPA's proposed partial disapproval and partial approval of the Texas Regional Haze State Implementation Plan ("SIP") and proposed Regional Haze Federal Implementation Plan ("FIP") for Texas (collectively, "Proposal"), which was published in the December 16, 2014 Federal Register.

AECT is an industry trade association representing electric companies in Texas. Organized in 1978, AECT provides a forum for member companies' representatives to exchange information on their industry, and to communicate with state and federal governmental officials. This letter is being submitted on behalf of the following AECT members: AEP, CenterPoint, El Paso Electric, Entergy, GDF Suez, Luminant, NRG, Oncor, and Xcel Energy.

For the reasons discussed below, AECT believes that EPA has not supported its Proposal. Thus, AECT requests that EPA not adopt its Proposal, but, instead, withdraw it and re-evaluate the Texas Regional Haze SIP using the corrected process, criteria, and information discussed in this letter and in the comment letters submitted by AECT member companies. AECT is confident that doing so will lead EPA to issue a revised proposal to fully approve the Texas Regional Haze SIP.

- A. EPA's Proposal is contrary to the Clean Air Act ("CAA"), and to EPA rules and/or guidance

1. EPA's Proposal disregards the primacy and considerable flexibility and discretion that Texas is supposed to have under the CAA, and the EPA Regional Haze rules and guidance, in determining what constitutes reasonable progress

EPA's Regional Haze rules and guidance clearly provide that each state has the primary role in determining what constitutes reasonable progress and that EPA is supposed to provide each state considerable flexibility and discretion in making that determination. EPA's Regional Haze rules "call for states to play the lead role in designing and implementing regional haze" SIPs.¹ Further, EPA previously stated that under its Regional Haze rules, each state has considerable flexibility and discretion in determining what constitutes reasonable progress.² Moreover, EPA previously stated that it will defer to a state's determination as to what constitutes reasonable progress if such determination has a reasoned basis.³

Notwithstanding the foregoing, in developing its Proposal, EPA usurped Texas' primary role in determining what constitutes reasonable progress, did not allow Texas any flexibility or discretion in making that determination, and provided Texas with no deference regarding that determination. EPA does not dispute that in determining what constitutes reasonable progress, Texas applied the four reasonable progress factors specified in the CAA and EPA's Regional Haze rules or that Texas had consultations with Oklahoma in accordance with EPA's Regional Haze rules and guidance. EPA merely determined that it would have conducted the reasonable progress analysis differently and made a different reasonable progress determination than Texas made, and based on those determinations, EPA issued its Proposal. Doing so is contrary to EPA's Regional Haze rules and guidance since they clearly provide that EPA is supposed to provide Texas with considerable flexibility, discretion, and deference in determining what constitutes reasonable progress, and EPA is not supposed to second guess Texas' reasonable progress determination and replace Texas' determination with its own reasonable progress determination.

In light of the foregoing, AECT requests that EPA defer to Texas' reasonable progress determination that is specified in its Regional Haze SIP.

2. EPA's proposed determination that Texas analyzed the "costs of compliance" factor incorrectly is not supported by the CAA, EPA's Regional Haze rules, or EPA's reasonable progress guidance

EPA's proposed determination that Texas analyzed the "costs of compliance" factor incorrectly is not supported by the CAA, EPA's Regional Haze rules, or EPA's guidance. Texas' analysis of the "costs of compliance" factor, however, is supported by the CAA, EPA's Regional Haze rules, and EPA's guidance.

¹ *American Corn Growers Ass'n. v. EPA*, 291 F.3d 1, 2 (D.C. Cir. 2002)

² EPA's Response to Petition for Reconsideration of Regional Haze Rule, at 11-12 (Jan. 10, 2001) (The Regional Haze rules are "based on the principle that states should have considerable flexibility in adopting visibility improvement goals and in choosing the associated emission reduction strategies for making 'reasonable progress' toward the national visibility goal", and those rules "provide each state with considerable discretion in establishing reasonable progress goals for improving visibility in the Class I areas.")

³ 77 Fed. Reg. 40150, 40156 (July 6, 2012) ("... as long as a state's reasonable progress determination "is done adequately and the state provides a reasoned basis for [it], EPA will defer to the state.")

EPA proposes to determine that Texas should have evaluated the costs of compliance factor individually for each of a select subset of Texas electric generating units (“EGUs”) that were identified in EPA’s screening process, rather than evaluating that factor collectively for all of those EGUs. That proposed determination is contrary to the CAA and EPA’s own Regional Haze rules, as the Tenth Circuit Court of Appeals recently held.⁴ Further, that proposed determination is contrary to EPA’s own guidance; in fact, EPA’s guidance clearly supports Texas’ evaluation of the costs of compliance factor collectively for all of the identified EGUs. EPA states on page 5-1 of its guidance document entitled “Guidance for Setting Reasonable Progress Goals under the Regional Haze Program” (June 1, 2007) (“Reasonable Progress Guidance”) that each state has the discretion to interpret the costs of compliance factor “to encompass the cost of compliance for . . . source categories . . .”. Further, EPA states on that same page that in applying the costs of compliance factor, states may use EPA’s BART guidelines,⁵ which provide that “states have flexibility in how they calculate costs” of compliance, and may choose to apply the costs of compliance factor collectively for all of the sources in a source category.⁶ Moreover, EPA states in other Regional Haze guidance that “reasonable progress is not required to be demonstrated on a source-by-source basis”.⁷ In light of the foregoing, AECT requests that EPA defer to Texas’ decision to evaluate the costs of compliance factor collectively for all of the identified EGUs.

In addition, Texas’ analysis of the costs of compliance factor, which fully considered the costs of additional sulfur dioxide (“SO₂”) and nitrogen oxides (“NO_x”) emissions controls at the identified EGUs relative to the predicted visibility improvement due to such additional controls, is consistent with the CAA, EPA’s Regional Haze rules, and EPA’s guidance. Indeed, Texas’ costs of compliance factor analysis is more supportable under the CAA, EPA’s Regional Haze rules, and EPA’s guidance than is EPA’s costs of compliance factor analysis, which considered the cost of the additional SO₂ emissions control per ton of SO₂ emissions it would reduce (in \$/ton SO₂ emissions reduced) for only a handful of sources, which EPA refers to as the “cost effectiveness” of each such control. Texas’ costs of compliance factor analysis is consistent with, and is more supportable under, the CAA, EPA’s Regional Haze rules, and EPA’s guidance because “compliance” for purposes of the reasonable progress requirements in the CAA and EPA’s Regional Haze rules should be viewed in relation to the visibility improvement that would be predicted to occur due to the additional SO₂ and/or NO_x emissions controls, rather than on the reduction in tons of SO₂ and/or NO_x emissions that would occur due to those additional emissions controls. On Page 5-2 of its Reasonable Progress Guidance, EPA states that because different pollutants impair visibility differently, in evaluating the costs of compliance factor, analyzing the costs of possible additional emissions controls relative to the visibility improvement that would be predicted to occur due to those controls may be more meaningful and appropriate than evaluating the cost effectiveness of such emissions controls in terms of their costs per ton of emissions they would reduce. Based on the foregoing, AECT requests that EPA

⁴ *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014) (“Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress.”)

⁵ 70 FR 39104 (July 6, 2005)

⁶ *Id.*, at 39127

⁷ EPA’s “Additional Regional Haze Questions” (September 27, 2006 Revision), available at <http://tinyurl.com/EPARHquestions>

defer to Texas' analysis of the costs of compliance factor, which involved consideration of the costs of additional SO₂ and NO_x emissions controls at the identified EGUs relative to the predicted visibility improvement due to such additional controls.

3. EPA's proposed requirement that a small number of Texas EGUs use additional and costly SO₂ emissions controls for Texas to meet the reasonable progress requirement is based on a factor -- visibility improvement -- that is not allowed by the CAA or EPA's Regional Haze rules

EPA's proposed requirement that a small number of Texas EGUs use additional and costly SO₂ emissions controls for Texas to meet the reasonable progress requirement is based on a factor -- visibility improvement -- that is not required by the CAA or EPA's Regional Haze rules. In developing that proposed requirement, to narrow down the number of emissions sources for which EPA might require additional SO₂ emissions controls, EPA considered the visibility improvement that would be predicted to occur if additional SO₂ emissions controls were required for those sources, and it identified the sources, all of which are EGUs, that it would further evaluate to determine if it would require additional SO₂ emissions control. EPA then determined the likely visibility improvements that might occur if different types of additional SO₂ emissions controls were used for each of those EGUs. For each EGU for which EPA determined that a type of additional SO₂ emissions control would provide for a "reasonable" or "significant" visibility improvement,⁸ EPA is proposing to require that the EGU use that type of additional SO₂ emissions control.

Visibility improvement is not just used as a factor on which EPA based its proposed requirement that a small number of Texas EGUs have to use additional and costly SO₂ emissions controls for Texas to meet its reasonable progress requirement, visibility improvement was the main factor that EPA used as its basis for that proposed requirement. EPA's use of visibility improvement as a factor, much less as the main factor, in developing that proposed requirement is not allowed under the CAA or EPA's Regional Haze rules. Both the CAA and EPA's Regional Haze rules specify the factors that states must consider in determining reasonable progress requirements, and visibility improvement is not one of those factors. Congress' inclusion of visibility improvement as one of the factors to be used in determining what constitutes BART in contrast to its non-inclusion of visibility improvement as one of the factors to be used in determining reasonable progress requirements, clearly demonstrates that Congress meant for visibility improvement to not be one of the factors that states must consider in making reasonable progress determinations, and certainly not the main factor. Federal case law supports that conclusion. Federal courts, including the U.S. Supreme Court, have held that it should be assumed that Congress acted intentionally when it included particular language in one section of a statute but omitted it in another section of the same statute.⁹ The similar non-inclusion in EPA's Regional Haze rules of visibility improvement as a factor that states must consider in determining reasonable progress requirements further demonstrates that EPA should not have used visibility improvement as factor, much less the main factor, in evaluating Texas' reasonable

⁸ 79 Fed. Reg. 74884 (Dec. 16, 2014)

⁹ *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222, 1237 (D.C. Cir. 2014) and *Barnhart v. Sigmon Coal Co.*, 534 U.S. 438, 452, 151 L. Ed. 2d 908, 122 S. Ct. 941 (2002), both citing *Russello v. United States*, 464 U.S. 16, 23, 104 S. Ct. 296, 78 L. Ed. 2d 17 (1983)

progress determination and in developing its proposed requirement that a small number of Texas EGUs use additional and costly SO₂ emissions controls for Texas to meet the reasonable progress requirement.

Moreover, even if it was appropriate for EPA to have used visibility improvement as a factor in developing that proposed requirement, it would not be appropriate for EPA to base that proposed requirement on whether the visibility improvement that would result from the additional SO₂ emissions controls would be “reasonable” or “significant”. That is because neither of those words is used, much less defined, in the CAA Regional Haze provisions or EPA’s Regional Haze rules.

Therefore, AECT requests that EPA re-analyze Texas’ reasonable progress determination by considering Texas’ evaluation of the four factors specified in the CAA and EPA’s Regional Haze rules, and by considering Texas’ evaluation of visibility improvement as part of its consideration of the costs of compliance factor, rather than as a separate factor.

4. EPA’s Proposal treats Texas differently from, and more stringently than, how it has treated other states with respect to their Regional Haze SIPs, and, thus, does not achieve the regional consistency that is required by its rules

EPA’s Proposal evaluates Texas EGUs and other emissions sources using different and more stringent standards than it has used for emissions sources in other states with respect to their Regional Haze SIPs. By way of example, contrary to how EPA’s Proposal evaluates Texas EGUs and other emissions sources, for the Regional Haze SIPs for other states, EPA: (i) did not require that determinations of reasonable progress be made on a source-by-source basis;¹⁰ (ii) used a different visibility model;¹¹ (iii) determined that CSAPR is sufficient to meet reasonable progress requirements, and, thus, did not require any source that complies with CSAPR to install additional emissions control to meet reasonable progress;¹² and (iv) determined that a predicted impact on a Class I area of 0.5 deciview (“dv”) was “relatively small” and that a source with a predicted impact on a Class I area at or below 0.5 dv should not be required to install additional emissions controls to meet reasonable progress.¹³

EPA’s evaluation of Texas EGUs and other emissions sources using different and more stringent standards than it has used for emissions sources in other states with respect to their Regional Haze SIPs is contrary to EPA’s regional consistency rules in 40 CFR 56.3(a) and (b).

¹⁰ See, e.g., Alaska 2011 SIP Narrative at 9-9 and 78 Fed. Reg. 10546, 10553 (Feb. 14, 2013) (final approval); Oregon 2011 SIP Narrative at 163 and 77 Fed. Reg. 50611, 50612 (Aug. 22, 2012) (final approval); Washington 2010 SIP Narrative at 9-5 to 9-7 and 79 Fed. Reg. 33438 (June 11, 2014) (final approval); Alabama 2008 SIP Narrative at 79 and 77 Fed. Reg. 38515, 38519 (June 28, 2012) (final approval)

¹¹ Declaration of Sam Coleman, *Nat’l Parks Conservation Ass’n v. McCarthy*, No. 11-01548, at 5 (D.D.C. 2014).

¹² See 77 Fed. Reg. 38515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38501 (June 28, 2012) (Georgia); 77 Fed. Reg. 34218 (June 11, 2012) (Indiana); 77 Fed. Reg. 38006 (June 26, 2012) (Iowa); 77 Fed. Reg. 19098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38007 (June 26, 2012) (Missouri); 77 Fed. Reg. 38185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 39177 (July 2, 2012) (Ohio); 79 Fed. Reg. 24340 (April 30, 2014) (Pennsylvania); 77 Fed. Reg. 38509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 35287 (June 13, 2012) (Virginia); 77 Fed. Reg. 16937 (March 23, 2012) (West Virginia)

¹³ 77 Fed. Reg. 30248, 30256 (May 22, 2012) (Idaho); 77 Fed. Reg. 30454, 30461, 30464 (May 23, 2012) (Oregon)

Those rules require EPA to uniformly apply the criteria, procedures, policies, and rules that it employs in implementing the CAA, and to identify and correct regional inconsistencies by standardizing such criteria, procedures, policies, and rules. In a recent decision, the D.C. Circuit Court of Appeals based its ruling that EPA had acted contrary to law on the requirements of 40 CFR 56.3(a) and (b).¹⁴

Based on the foregoing, AECT requests that EPA re-evaluate Texas' Regional Haze SIP using the same standards than it has used for other states' Regional Haze SIPs.

B. EPA's Proposal is unnecessary because EPA's IMPROVE visibility monitoring data demonstrate that EPA's proposed 2018 reasonable progress goals have already been met for the three Class I areas

Actual visibility monitoring data from EPA's IMPROVE visibility monitoring data show that the three Class I areas (Big Bend, Guadalupe Mountains, and Wichita Mountains) have already achieved EPA's proposed 2018 reasonable progress goals -- without any of the additional SO₂ emissions controls that EPA is proposing to require for the identified Texas EGUs.¹⁵ The most recent five-year (2009–2013) averages of visibility monitoring data are 15.3 dv at Guadalupe Mountains, 16.3 dv at Big Bend, and 21.2 dv at Wichita Mountains.¹⁶ Each of those is lower than EPA's proposed 2018 reasonable progress goals for each of those areas of 16.26 dv at Guadalupe Mountains, 16.57 dv at Big Bend, and 21.33 dv at Wichita Mountains.^{17,18}

Therefore, the most recent five-year (2009–2013) averages of EPA's IMPROVE visibility monitoring data show that EPA has not provided adequate support that any of the additional SO₂ emissions controls for the identified Texas EGUs is needed to meet EPA's proposed 2018 reasonable progress goals for any of the three Class I areas. Further, visibility monitoring data for 2018 should be even lower than it was in that five-year period since EPA's IPM modeling predicts that visibility-impairing emissions in Texas will progressively decline through 2018. Accordingly, AECT believes that EPA has not supported its proposal to require additional SO₂ emissions controls for any of the identified Texas EGUs.

C. The costs of compliance of EPA's Proposal are unreasonable

¹⁴ *National Environmental Development Ass'n's Clean Air Project v. EPA*, 752 F.3d 999 (D.C. Cir. 2013)

¹⁵ This is likely true because the actual Texas SO₂ emissions are much lower than the forecasted Texas SO₂ emissions that EPA included in its FIP visibility modeling, as is discussed in Section D below.

¹⁶ 79 Fed. Reg. at 74843, 74870

¹⁷ *Id.*, at 74887, Table 43

¹⁸ Though EPA's Proposal suggests that weather (i.e., temperature and precipitation) may have caused the five-year average of IMPROVE monitoring data to be abnormally low and, thus, be below EPA's proposed 2018 reasonable progress goals for the three Class I areas and be projected to meet their Uniform Rate of Progress for 2018 for those areas, AECT believes that weather did not cause the IMPROVE monitoring data to be abnormally low. Available information on temperatures and precipitation suggests that other than 2011 and 2012, none of the years were unusually cool or wet, or otherwise conducive to abnormally low levels of haze. In fact, some of the IMPROVE monitoring data is associated with one or more exceptional events that actually caused abnormally high levels of haze. For example, an unusually intense series of wildfires in Mexico appear to be responsible for the abnormally high levels of haze observed at Big Bend in 2011, and a dust storm appears to be responsible for the abnormally high levels of haze observed at the Guadalupe Mountains in 2012.

As discussed under Section A.2. above, the CAA, EPA's Regional Haze rules, and EPA's guidance support evaluation of the reasonable progress costs of compliance factor by considering the total cost of the additional emissions controls at the identified EGUs relative to the visibility improvement that modeling predicts would result from such additional controls. Evaluating the cost of compliance of EPA's Proposal in that manner shows that its cost of compliance is clearly unreasonable, and, thus, EPA's Proposal is not supportable.

EPA calculates that its Proposal would require just four Texas companies to spend approximately \$1.8 billion for additional SO₂ emissions controls for their EGUs.¹⁹ AEET, however, believes that the costs those companies would have to spend for such additional SO₂ emissions controls would be greater than \$2 billion. In addition, EPA's projected total visibility improvements that would result by 2018 in each of the three Class I areas due to the addition of such SO₂ emissions controls are only 0.03 dv for Big Bend, 0.04 dv for Guadalupe Mountains, and 0.14 dv for Wichita Mountains.²⁰ Each of those projected total visibility improvements is much less than 1.0 dv, which is the degree of visibility improvement that can be detected by the eyes of most humans.²¹ Moreover, each of those projected total visibility improvements is much less than 0.5 dv, which, it is critical to note, EPA has previously determined is the appropriate visibility improvement threshold against which to compare the predicted visibility improvement due to an individual source installing additional emissions control for reasonable progress purposes.²²

Based on the foregoing, regardless of whether the total cost for additional SO₂ emissions controls for the identified EGUs is \$1.8 billion or greater than \$2 billion, the cost of compliance of EPA's Proposal is clearly unreasonable, and, thus, EPA's Proposal is not supportable.

- D. EPA's Proposal lacks a reasonable basis because EPA's FIP visibility modeling predicts higher visibility impacts from Texas emissions sources in 2018 than will actually occur because those sources' SO₂ emissions that were used in such modeling are outdated and fail to reflect the substantial SO₂ emissions reductions those sources have achieved or will achieve by 2018

EPA's FIP visibility modeling predicts higher visibility impacts from Texas emissions sources in 2018 than will actually occur because those sources' SO₂ emissions that EPA used in such modeling are outdated and fail to reflect the substantial SO₂ emissions reductions those sources have achieved or will achieve by 2018. Specifically, in conducting its FIP visibility modeling, EPA assumed that Texas emissions sources would emit 749,119 tpy of SO₂ in 2018 based on a projection from the 2002 CENRAP SO₂ emissions inventory.²³ However, more recent data show that SO₂ emissions from Texas emissions sources have decreased much faster than EPA projected. Indeed, EPA's most recent national SO₂ emissions inventory shows that, by 2011, actual Texas SO₂ emissions were only 558,502 tpy, or only about 75% of the 749,119 tpy of SO₂ emissions that EPA assumed in conducting its FIP visibility modeling. Moreover, when

¹⁹ See EPA, *Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan* at 24-25 (Nov. 2014) (scrubber retrofit capital costs); *id.* at 55 (scrubber upgrade costs)

²⁰ 79 Fed. Reg. at 74887, Table 43

²¹ 77 Fed. Reg. at 30250

²² 77 Fed. Reg. at 30464

²³ 79 Fed. Reg. at 74858, Table 20

EPA's IPM projections are applied to the 558,502 tpy of SO₂, the 2018 Texas SO₂ emissions are projected to be only 259,743 tpy, or only about 35% of the 749,119 tpy of SO₂ emissions that EPA assumed in conducting its FIP visibility modeling.

A recent court decision requires that EPA consider the effect of the more recent and more accurate SO₂ emissions data in determining whether any additional SO₂ emissions controls are needed for the identified Texas EGUs to meet the reasonable progress requirements.²⁴ If EPA uses more recent and more accurate SO₂ emissions in its FIP visibility modeling, the predicted visibility impacts from Texas emissions sources in 2018 will be significantly lower than the visibility impacts predicted by the FIP visibility modeling that EPA used to support its Proposal. In fact, AECT is confident that the visibility impacts predicted by such modeling will be so low that EPA will be required to conclude that there is no support for the proposed requirement for additional SO₂ emissions controls on the Texas EGUs.

E. EPA's proposal to require additional SO₂ emissions controls for the identified Texas EGUs is unreasonable in light of the role of international emissions in causing visibility impairment in Class I areas

EPA's updated international emissions estimates further demonstrate the unreasonableness of EPA's proposal to require additional SO₂ emissions controls on the identified Texas EGUs. CENRAP's Particulate Matter Source Apportionment Technology ("PSAT") modeling analysis indicates that emissions from Mexico and other countries south of the United States contribute about 52% of the visibility impairment at Big Bend and 25% of the visibility impairment at the Guadalupe Mountains.²⁵ By comparison, the PSAT modeling analysis indicates that the SO₂ emissions from Texas EGUs contribute less than 5% of the visibility impairment at each area.²⁶

Further, the contribution of the SO₂ emissions from the Texas EGUs to visibility impairment in the Class I areas is expected to decrease in the future while the contribution of emissions from international sources to visibility impairment in those areas is expected to increase in the future. That is because EPA has projected that SO₂ emissions from Mexico will increase by 26% from 2012 to 2030,²⁷ while the SO₂ emissions from the Texas EGUs will decline over that timeframe (as discussed above). Even if the contributions of the SO₂ emissions from the Texas EGUs to visibility impairment at the Class I areas were eliminated, visibility improvements in those areas are not likely due to the significant contribution of emissions from sources in Mexico and other countries south of the United States to visibility impairment at such areas.

²⁴ *Sierra Club v. EPA*, 671 F. 3d 955 (9th Cir. Jan. 20, 2012) (rejecting an EPA SIP approval that relied on an emissions projection that had been superseded in the time between the state's SIP submission and EPA's action on it)

²⁵ "Technical Support Document for the Texas Regional Haze State Implementation Plan" (November, 2014), Table 15

²⁶ *Id.*, Figures 6 and 8

²⁷ "Developing Mexico National Emissions Inventory Projections for the Future Years of 2008, 2012, and 2030" (Martinus E. Wolf, et.al.)

In light of the foregoing, AECT believes that it is unreasonable for EPA to ignore the impact of emissions from international sources and require additional SO₂ emissions controls for the identified Texas EGUs.

F. EPA's proposed disapproval of the natural visibility conditions specified in Texas' SIP lacks a reasoned basis

EPA has proposed to disapprove the natural visibility conditions in Texas' SIP and to set more stringent natural visibility conditions, which would make Texas' Uniform Rate of Progress glide path more stringent (i.e., require faster improvement in visibility). EPA's stated basis for these proposed actions is its belief that Texas' approach for establishing the natural visibility conditions has "significant uncertainty".²⁸ That is an insufficient basis for EPA to use to support those proposed actions, especially since EPA has not shown that its own approach for establishing the natural visibility conditions has greater certainty.

In addition, EPA has not adequately supported its proposed position that it is inappropriate for Texas to establish natural visibility conditions by assuming that most or all of the soil and coarse mass identified in the monitoring data can be attributed to natural sources, such as wildfires and dust storms, or EPA's proposed default method that does not account for natural sources. Moreover, EPA's proposed position to not allow Texas to consider the emissions from natural sources, such as wildfires and dust storms, in establishing natural visibility conditions is inconsistent with its approval of the New Mexico Regional Haze SIP. EPA concurred with New Mexico that it was appropriate to consider emissions from natural sources, such as wildfires and dust storms, because New Mexico "has limited ability to control" such sources of visibility impairment and they will continue to "limit the visibility improvement [that is] achievable".²⁹

For the foregoing reasons, AECT believes that Texas has fully supported its determination of natural visibility conditions in its Regional Haze SIP, and AECT requests that EPA approve those natural visibility conditions.

G. EPA's proposed FIP requirement for some Texas EGUs to install new scrubbers is inappropriate because those scrubbers could not be installed until after the end of the 2008-2018 period covered by the FIP

EPA's Proposal would require some Texas EGUs to install new scrubbers, but EPA has concluded that those scrubbers could not be installed until sometime after 2018.³⁰ In light of that, the requirement to add those new scrubbers cannot reasonably be part of EPA's proposed FIP for Texas since the scopes of the Texas Regional Haze SIP and the proposed EPA FIP are limited to the 2008-2018 planning period. In light of that, and of the "time necessary for compliance" factor, it is inappropriate for EPA to require that any Texas EGU install a new scrubber as part of the proposed FIP.

²⁸ 79 Fed. Reg. at 74831

²⁹ 77 Fed. Reg. 70593 (Nov. 27, 2012)

³⁰ 79 Fed. Reg. at 74874 ("typical SO₂ scrubber installations can take up to five years to plan, construct and bring to operational readiness", which will be much later than 2018)

H. If EPA adopts its Proposal, judicial review of it will be proper in the Fifth Circuit Court of Appeals

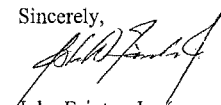
AECT disagrees with EPA's assertion that any petitions for review must be filed in the U.S. Court of Appeals for the D.C. Circuit because EPA's adoption of the Proposal would have "nationwide scope or effect". EPA's assertion that its adoption would have "nationwide scope or effect" is based on its claims that (i) the Proposal discusses EPA's interpretations of provisions in its Regional Haze rules and such interpretations would be applicable to all states, and (ii) its adoption would have "scope or effect beyond a single judicial circuit".³¹ AECT does not see how either of those bases would support EPA's assertion that its adoption would have "nationwide scope or effect."

EPA's interpretation of its Regional Haze rules in its Proposal cannot be applicable to all states since EPA has already made determinations on the Regional Haze SIPs under those rules for all states except for the two states that are covered by its Proposal.³² Notwithstanding that, it cannot be true that an EPA action regarding one state's SIP has "nationwide scope or effect" merely because that action involved EPA interpreting its rules that the state's SIP is addressing and such interpretations might be used in its evaluations of other states' SIPs that address those rules. If that was true, AECT cannot conceive of an EPA action regarding a SIP that would not have "nationwide scope or effect", and, thus, would be subject to judicial review in the applicable circuit court of appeals.

In addition, if EPA was to adopt its Proposal, that action would not have "scope or effect beyond a single judicial circuit". That action would only impose legal requirements on EGUs in Texas. Accordingly, any legal challenge to that action would only relate to its impacts on EGUs in Texas. Since Texas is only covered by a single judicial circuit -- the Fifth Circuit -- EPA's action would not have "scope or effect beyond a single judicial circuit", and thus, would not have "nationwide scope or effect".

AECT appreciates the opportunity to submit these comments and EPA's consideration of them. If you have any questions, please contact me at (512)474-6725 or john@aect.net.

Sincerely,


 John Fainter, Jr.
 President and CEO

³¹ 79 Fed. Reg. at 74888

³² 79 Fed. Reg. at 74820 (stating that EPA has "acted on all of the states' regional haze SIPs for the first planning period except for the Texas regional haze SIP and certain portions of the Oklahoma regional haze SIP")

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**Edison Electric
Institute**

Quintan J. Shea, III
Vice President, Environment

April 20, 2015

Mr. Guy Donaldson
Chief, Air Planning Section (6PD-L)
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Mr. Donaldson:

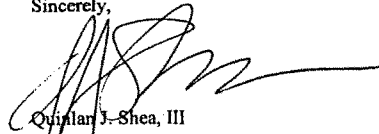
The Edison Electric Institute (EEI) appreciates the opportunity to submit comments on the proposed *Regional Haze State Implementation Plan/Federal Implementation Plan* issued by the Environmental Protection Agency (Agency) in Docket No. EPA-R06-OAR-2014-0754. 79 *Fed. Reg.* at 74,818 (December 16, 2014).

EEI is the association that represents all U.S. investor-owned electric utilities, international affiliates and industry associates worldwide. Our members provide electricity for 220 million Americans, operate in all 50 states and the District of Columbia, and directly employ more than 500,000 workers. With more than \$90 billion in annual capital expenditures, the electric power industry is responsible for millions of jobs outside our direct operations. Reliable, affordable and sustainable electricity powers the economy and enhances the lives of all Americans. As generators of electricity and operators of the nation's electric transmission and distribution system, EEI's member companies have a strong interest in any proposed rule that potentially impacts the industry and the ongoing transition of the domestic fleet.

EEI member companies operate facilities directly affected by the Agency's proposed action. As part of the ongoing transition to cleaner sources of generation, the electric power sector generally—and Oklahoma and Texas generators in particular—have cut emissions significantly in recent years and will continue to do so under many EPA regulations, even without the regional haze FIP proposed by EPA here. EEI files these comments to ensure that the Agency allows states to determine how best to consider additional controls, consistent with effective long-term utility planning; to urge EPA to consider the comments of both Luminant and Southwestern Public Service Company; and to support EPA's proposal to not seek further reductions from Oklahoma facilities.

EEI looks forward to continued dialogue with Agency officials on this important rulemaking. If you have any questions concerning EEI's comments, please contact me, John Kinsman (jkinsman@eei.org, 202-508-5711) or Alex Bond (abond@eei.org, 202-508-5710).

Sincerely,

A handwritten signature in black ink, appearing to read "Quinlan J. Shea, III", with a long horizontal flourish extending to the right.

Quinlan J. Shea, III

cc: Janet McCabe, Acting Assistant Administrator, OAR
Joseph Goffman, Senior Counsel

**COMMENTS OF THE EDISON ELECTRIC INSTITUTE
ON THE APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS;
TEXAS AND OKLAHOMA;
REGIONAL HAZE STATE IMPLEMENTATION PLANS;
INTERSTATE TRANSPORT STATE IMPLEMENTATION PLAN TO ADDRESS
POLLUTION AFFECTING VISIBILITY AND REGIONAL HAZE;
FEDERAL IMPLEMENTATION PLAN FOR REGIONAL HAZE AND INTERSTATE
TRANSPORT OF POLLUTION AFFECTING VISIBILITY**

Docket No. EPA-R06-OAR-2014-0754

April 20, 2015

The Edison Electric Institute (EEI) submits these comments on the proposed *Approval and Promulgation of Implementation Plans* for the states of Texas and Oklahoma (proposal) by the U.S. Environmental Protection Agency (EPA, or Agency) in Docket No. EPA-R06-OAR-2014-0754. *See 79 Fed. Reg.* 74,818 (December 16, 2014). In this action, EPA proposes to partially approve and partially disapprove a revision to the Texas State Implementation Plan (SIP), partially disapprove of Texas's and Oklahoma's Reasonable Progress Goals (RPGs) for their respective Class I areas, and issue a Federal Implementation Plan (FIP) for both Texas and Oklahoma to remedy certain claimed SIP "deficiencies." *Id.*¹

EEI is the association that represents all U.S. investor-owned electric companies, international affiliates and industry associates worldwide. Our members provide electricity for 220 million Americans, operate in all 50 states and the District of Columbia, and directly employ more than 500,000 workers. With more than \$90 billion in annual capital expenditures, the electric power

¹ EPA also affirmed as part of this proposal that compliance with the Cross-State Air Pollution Rule satisfies the Best Achievable Retrofit Technology requirements for regional haze. EEI supports this important decision by the Agency to properly recognize the impacts of other Clean Air Act regulations on the electric power sector and how those other regulations have improved air quality and can be used for compliance with other pendant regulations.

industry is responsible for millions of additional jobs. Reliable, affordable and sustainable electricity powers the economy and enhances the lives of all Americans.

EEI member companies operate facilities that are directly affected by the Agency's proposed action. As part of the ongoing transition to cleaner sources of generation, the electric power sector generally—and Oklahoma and Texas generators in particular—have cut emissions significantly in recent years and will continue to do so under many EPA regulations, even without the regional haze FIP proposed by EPA here. EEI files these comments to ensure the Agency allows states to determine how best to consider additional controls, consistent with effective long-term utility planning in regulated and competitive markets; to raise serious concerns regarding EPA's attempt to use a 2018 interim milestone to require the installation of extensive control equipment that EPA concedes cannot be in place until 2020 at the earliest; and to urge EPA to consider the comments of both Southwestern Public Service and Luminant. Finally, EEI supports EPA's proposal to not seek further reductions from Oklahoma facilities given the recently finalized, litigated and currently in place FIP in Oklahoma being implemented by Oklahoma utilities.

The Regional Haze Process Must Be Implemented Reasonably Going Forward.

The Clean Air Act (CAA) regional haze program tasks states with determining what is reasonable progress toward elimination of man-made visibility impairment, for which EPA has set a goal of 2064, along with specific progress milestones (10-year planning and SIP revisions,

with program reviews in the middle of the 10-year planning periods).² The regional haze program contemplates gradual visibility improvements along a “glide path” that considers the 2064 goal, and does not require immediate reductions that exceed making “reasonable progress”, as determined by the state based on four statutory factors,³ in the first planning period through 2018 or in any subsequent planning period. Thus, it neither requires nor authorizes the front-loading of extensive control requirements. Instead, the regional haze program should be implemented in a manner that allows states, through state environmental and electric utility regulators and in conjunction with power companies, to plan the optimal timing of emission control projects. This planning process is vital in order to minimize impacts on the cost and reliable provision of electric power and to allow investment decisions to be made over suitable planning horizons. It is additionally justified given the, at best, minimal visibility benefits EPA claims would be achieved in the proposed rulemaking.

Thus, as EPA and the states begin to implement the next rounds of the regional haze program to continue reasonable progress, EPA should allow states to consider the timing and scope of additional control activities, consistent with effective long-term utility planning. EPA also must take into consideration the progress already made through the installation of controls to satisfy Best Achievable Retrofit Technology (BART) requirements and BART-equivalent measures such as the Cross-State Air Pollution Rule (CSAPR) and through other CAA regulations that can result in reduced emissions that may contribute to visibility impairment.

² The first 10-year planning period began in 2009 and ends in 2018. The next runs from 2019-2028, with SIPs due in 2018.

³ Cost of compliance, time necessary for compliance, energy and non-air quality impacts of compliance, and remaining useful life of any existing source subject to such requirements.

Further, EEI notes that it will be necessary to use the most up-to-date and accurate implementation tools available as EPA and the states move forward with the regional haze reasonable progress determinations. To that end, EPA should update both its atmospheric modeling platforms as part of the upcoming Appendix W rewrite and the cost manual in order to support reasonable future assessments of visibility impacts and appropriate control strategies. The Agency should do this consistent with the Consolidated Appropriations Act of 2014. *See* H.R. 3547, P.L. 113-76. EPA also should consider the latest available visibility monitoring data for Class I areas when assessing potential controls needed to meet RPGs.

The Proposed FIP Raises Serious Timing, Technical and State Primacy Concerns.

EPA's proposed partial disapproval of Texas's and Oklahoma's SIPs and imposition of its own FIP raises serious timing, technical and state primacy concerns by requiring significant reductions to address 2018 milestones that will not be technically in place or effective before 2018, and which explicitly override a prudently considered state plan, and which are not consistent with the intent or structure of the regional haze program. *See 79 Fed. Reg. 74,821-2.*

A. The proposed timing in the FIP is unjustified

The Agency's proposed FIP raises serious concerns in its attempt to require reductions to meet the 2018 RPGs for three federally-protected Class I visibility areas in Texas (Big Bend National Park and Guadalupe Mountains National Park) and Oklahoma (Wichita Mountain Wilderness Area). *Id.*

The Agency is attempting to require controls well beyond the Texas SIP that it knows will not be in place or effective within the first planning period, i.e., by 2018. EPA's proposal thus exceeds the scope of the state's submission and the Agency's authority to issue a FIP. EPA's proposal is at variance with the "time necessary for compliance" statutory factor in 42 U.S.C. § 7491(g)(1) for determining reasonable progress. Moreover, it also is unreasonable to require the proposed emissions controls on a tight regulatory timeline.

Given that the regional haze program's target extends to 2064, EPA's insistence on requiring extensive control equipment installations that will not be technically in place or effective to meet a 2018 milestone is unjustified at this time. Instead, these controls should only be considered by the states during the next planning period that runs between 2019 and 2028. This also is a more reasonable approach that would allow for the consideration of updated data, use contemporaneous monitoring and meteorological conditions, and would avoid overreliance on data and modeling that are more than 10 years out of date. Further, such an approach would allow the coordination of these important investment and regulatory decisions with the implementation of other pending regulations. Finally, this approach would give states and regulated entities the opportunity to conduct integrated compliance planning in ways that are consistent with provision of reliable and affordable electric power.

B. There are significant technical issues with the proposed emissions limits

The unit specific limits in EPA's proposed FIP also present significant technical concerns and may not be achievable in all cases, or would require more significant operational and engineering challenges than EPA has considered.

For example, EPA is proposing that Southwestern Public Service's Tolk Facility retrofit dry flue-gas desulfurization (FGD) equipment in order to meet a proposed sulfur dioxide (SO₂) emissions limitation of 0.06 lbs/MMBtu on a 30-day rolling average. *Id.* at 74,822. The scrubber retrofits would not be in place by the end of the first planning period in 2018. Further, it also is not clear that the Tolk facility will be able to achieve a SO₂ emissions limitation of 0.06 lbs/MMBtu. The installation of a dry FGD system at the Tolk Facility will stress the already scarce local water resources of western Texas, as dry FGD systems (in contrast to their name) require significant amounts of water in order to run effectively and operate efficiently. The Tolk facility is in an area that already is stressed for water use; adding a dry FGD system will introduce a significant new draw on the water resources near the facility that might not be sustainable. EEI urges that EPA seriously consider the significant technical comments filed by Southwestern Public Service regarding issues and concerns about the impacts of the proposal on its Tolk facility and the surrounding community.

EPA also is requiring that Luminant retrofit several facilities with FGD systems and upgrade other FGD systems in order to meet more stringent SO₂ limits at Big Brown 1-2, Martin Lake 1-3, Monticello 1-3 and Sandow 4 units. *Id.* Similar to Southwestern Public Service's Tolk facility, the retrofitted equipment cannot be completed within the first planning period. Moreover, the stringent SO₂ limits that EPA is proposing for Luminant's units are neither consistent with "reasonable progress" nor reflective of the state's consideration of several factors, including available technology and costs, that are specified in EPA regulations. *See* 40 C.F.R. § 51.301. Specifically, EPA's proposed emissions rate of 0.04 lbs. SO₂/MMBtu for many

of Luminant's existing units is as stringent as the lowest achievable emission rate (LAER) for new units, rather than values typically applied to existing units, and is more stringent than Best Available Retrofit Technology (BART) limits that EPA has recently approved for existing EGUs. EEI urges EPA to consider the significant technical comments filed by Luminant regarding issues and concerns about the impacts of the proposal on their facilities.

C. The proposal does not appropriately recognize state primacy under the CAA

EPA's proposal raises serious state primacy concerns with its proposed partial disapproval of Texas' and Oklahoma's SIPs and the imposition of its own FIPs. As a general matter, EPA must respect the role of the states in the regional haze process as authorized by the CAA, and properly submitted state SIPs have primacy over EPA's FIPs. In this instance, EPA's proposal does not reflect the flexibility and discretion that states are granted as part of the regional haze SIP process; instead, the proposed FIP is inflexible by comparison, with unreasonably tight timelines and strict emissions limitations. As EPA recognizes in its regional haze guidance to the states, the regulations "give[] States wide latitude to determine additional control requirements" and, in applying the four statutory factors, states "have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant."⁴ Indeed, EPA itself has explained that, "[a]s long as this evaluation is done adequately and the states provide a reasoned basis for their decisions, EPA will defer to the state" in its reasonable progress determinations. *See 77 Fed. Reg.* at 40,150, 40,156. EPA's proposed FIPs depart from the Agency's still-effective guidance.

⁴ EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, June 1, 2007 at 4-2, 5-1.

Texas' and Oklahoma's SIPs were well considered and EPA should approve such state-led regulatory processes. In support of its proposed FIP, EPA's main rationale is that Texas and Oklahoma did not properly confer regarding RPGs. This forms the basis for the Agency's disapproval of Texas' and Oklahoma's SIPs and the imposition of its own FIP. *Id.* at 74,823. However, Texas and Oklahoma's conferral regarding the RPGs was fully consistent with the CAA and the regional haze regulations, and, during that process, the states agreed on which regulatory programs were needed for reasonable progress.⁵ EPA must respect this decision and recognize that the Agency's imposition of a FIP is unreasonable and unauthorized under the CAA given these state actions.

The Visibility Impacts Do Not Justify the Proposed Control Levels and the Proposal Will Require Significant Costs to Consumers.

EPA's own analysis in the proposed rule shows that the units EPA has identified as required to install additional controls or upgrade existing controls as part of the FIP have a very minimal impact of far less than one deciview on the target areas' visibility. *See 79 Fed. Reg.* at 74,887, Table 45. Further, the three Class I areas identified by EPA already have achieved better visibility than the goals EPA proposes to set for 2018, as shown in the below table. This makes EPA's disapproval of the Texas and Oklahoma SIPs inappropriate and unsupported. *See* Testimony of the Texas Commission on Environmental Quality, Public Hearing, Austin, TX (Jan. 13, 2015); *see also 79 Fed. Reg.* at 74,843, 74,870 (discussing current visibility monitoring

⁵ *See* March 25, 2008 letter from Susana M. Hildebrand, Air Quality Division, Texas Commission on Environmental Quality to Eddie Terrill, Air Quality Division, Oklahoma Department of Environmental Quality; and May 12, 2008 letter from Eddie Terrill, Air Quality Division, Oklahoma Department of Environmental Quality to Susana M. Hildebrand, Air Quality Division, Texas Commission on Environmental Quality.

data showing progress beyond EPA's 2018 targets) and 79 *Fed. Reg.* at 74,887, Table 43 (showing the proposed RPGs).

Class I Area	Actual Observed Conditions from IMPROVE Monitors (2009-13) (5-year average) in deciviews	EPA's Proposed RPG (2018) in deciviews
Big Bend	16.3	16.57
Guadalupe Mountains	15.3	16.26
Wichita Mountains	21.2	21.33

Thus, the existing regulatory programs put into place by Texas in its SIP are accomplishing in practice what EPA seeks to achieve with the imposition of more stringent control equipment on a regulatory timeline that will not deliver any benefits within the first planning period.

The Agency's proposed FIP—per EPA's own estimate—will require the investment of approximately \$2 billion dollars in retrofits and upgrades, resulting in increased consumer costs for Texas energy consumers. *See* 79 *Fed. Reg.* 74,876-77. The retrofit cost estimates EPA used for Southwestern Public Service's Tolk facility are inaccurately low and not based on Tolk's site-specific circumstances. Specifically, the proposal does not reflect the significant capital cost of water upgrades that would be necessary to operate proposed dry scrubbers at this location.⁶ EPA's proposed FIP will impose far greater costs on utilities and customers than estimated in the Agency's proposal.

⁶ Comments submitted by Luminant explain the many ways in which EPA has understated the costs, and overstated the benefits, of the controls that EPA proposes for Luminant units.

EEI Supports EPA's Proposal to Not Establish Any Additional Requirements on Sources Within Oklahoma.

The proposal also implicates Oklahoma through its obligations for RPG in the Wichita Mountains. EPA proposes to partially disapprove Oklahoma's 2010 SIP regarding the RPG for the Wichita Mountains and replace that part of their plan with the proposed FIP that relies upon the reductions in Texas to satisfy the 2018 milestone for the Wichita Mountains. EPA states in the proposal that the 2018 targets for the Wichita Mountains could not be achieved without emissions reductions from sources in Texas. *See 79 Fed. Reg. 74,823.*

EPA's analysis, however, does not take into account all emission reductions from Oklahoma sources. Oklahoma sources are currently implementing the final 2012 SIP and FIP provisions for the state's regional haze obligations and are in the process of retiring, converting or installing expensive control equipment on affected units through 2019. EPA's proposal appropriately "does not establish any additional requirements on sources within Oklahoma." *Id.* at 74,818. EPA cannot ignore these reductions when assessing whether additional reductions are necessary to achieve the goals of the regional haze program. Given the current Oklahoma SIP and FIP in place for regional haze and the fact that the Wichita Mountains are already attaining the 2018 milestones, additional reductions are not required.⁷ Further, the Agency cannot ignore the additional emissions reductions that are occurring within the state as a result of compliance with other air quality rules, including the Mercury and Air Toxics Standards (MATS), which will result in the conversion to natural gas or retirement of 60% of Oklahoma's coal-fired generation.

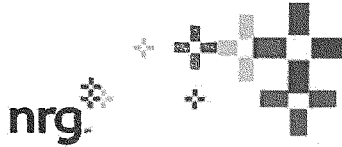
⁷ As shown in above table of IMPROVES monitoring data.

Conclusion.

As EPA and the states begin to implement the next round of the regional haze program to address reasonable progress requirements in pursuit of the 2064 goal, the Agency should allow states to consider how best to assess and plan additional controls activities, consistent with effective long-term utility planning, and take into consideration the progress made by the electric power and other sectors in improving visibility through the installation of controls to satisfy BART and BART-equivalent programs like the CSAPR.

EPA's insistence in the proposed FIP on requiring extensive control equipment that will not technically be in place or effective to meet a 2018 milestone is problematic. Instead, the proper course is for the states to consider these and other control options as part of the suite of possible actions that can be taken during the next planning period that runs between 2019 and 2028.

EEI also urges EPA to consider the technical comments of both Southwestern Public Service and Luminant regarding unit-specific and other concerns. Finally, EEI supports EPA's proposal to not seek further reductions from Oklahoma facilities given the recently finalized, litigated and currently in place FIP in Oklahoma being implemented by Oklahoma utilities. EPA must include the reductions that will occur as a result of this Oklahoma FIP and compliance with other air quality rules when determining whether additional reductions are required to achieve the goals of the regional haze program in both Texas and Oklahoma.



NRG Texas Power LLC
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April 20, 2015

Via Email and Hand-Delivery
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Mr. Guy Donaldson
Chief, Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: NRG Texas Power LLC Comments on Regional Haze Proposal
Docket ID No. EPA-R06-OAR-2014-0754

Dear Mr. Donaldson:

NRG Texas Power LLC ("NRG") respectfully offers the following comments on EPA's proposed actions on the Texas plan to address regional haze, which would require stringent new emission controls on certain of NRG's electric power generating assets in Texas, announced at 79 Fed. Reg. 74,818 (Dec. 16, 2014).

NRG is a subsidiary of NRG Energy, Inc., a Fortune 250 Company and one of the country's largest power generation and retail electricity businesses. NRG Energy's power plants provide about 52,000 megawatts of generation capacity and its retail businesses serve more than 3 million customers throughout the country. In Southeast Texas, NRG owns more than 11,000 MW of generation capacity from nine electric generating stations. NRG supports clean energy resources and technologies critical to our transition to a sustainable, low carbon society. We appreciate the opportunity to provide comments on EPA's proposal.

1. NRG supports certain aspects of the proposal.

To the extent that EPA has proposed to approve components of the Texas regional haze plan, NRG supports the proposal. Specifically, NRG supports EPA's proposed findings that Texas has met requirements for:

- Identifying the baseline conditions at Big Bend and the Guadalupe Mountains.
- Addressing "reasonably attributable visibility impairment," or RAVI.
- Mitigating the impacts of construction activities on visibility impairment.
- Considering source retirement and replacement schedules as part of the state's long-term visibility strategy.
- Implementing smoke management techniques.

- Providing enforcement authority.
- Quantifying visibility changes that may result from emission changes over the term of the long-term strategy.
- Implementing a regional haze monitoring strategy, emissions inventory, and appropriate federal land manager consultations.

EPA should also approve all other aspects of the Texas regional haze plan, and should not implement a federal implementation plan ("FIP"). As explained in NRG's detailed comments below, NRG does not support EPA's proposed disapproval of various plan elements or promulgation of a FIP.

2. No additional controls are needed to assure reasonable progress.

EPA has proposed to require substantially upgraded SO₂ controls on NRG's Limestone Electric Generating Station Units 1 and 2 on the basis that these controls are necessary to assure reasonable progress in reducing regional haze. As explained below, NRG believes that such controls are unnecessary to achieve reasonable progress, and are objectively unreasonable. Thus, EPA should not disapprove and replace the reasonable progress goals or impose the additional controls on Limestone Units 1 and 2 contemplated by the proposal.

a. The FIP would result in no detectable change in visibility.

Even if EPA's modeling and emissions inventories were accepted, additional controls would be unjustified because there would be no change to visibility as a result of EPA's proposed control measures. At most, EPA projects that its proposed controls would result in a 0.284 deciview visibility improvement associated with NRG's facilities.¹ This is a visibility change that is less than one-third of what the human eye can detect.

EPA has also acknowledged that the actual visibility impact of its proposal will be much smaller than the 0.284 deciview improvement. For the actual worst 20 percent of days--the same dataset tracked under the reasonable progress rule EPA is implementing--the visibility improvement from NRG's facilities would be only 0.057 deciview.²

Notably, EPA has previously found a larger, 0.5 deciview impact to be insufficient to justify further regulation.³ Thus, it would be inconsistent for EPA to pursue smaller changes in visibility by regulating Limestone as proposed.

b. EPA's FIP modeling inventories are outdated, fail to integrate substantial recent reductions, and artificially inflate the modeled impacts of Texas sources.

EPA used an outdated base year and future year emissions inventory in its modeling that had the effect of inflating the modeled impacts of Texas sources on visibility impairment.

As explained in the attached report by Alpine Geophysics, EPA assumed through the current proposal that Texas sources would emit 749,119 tons per year (tpy) of SO₂ in 2018 based on a projection from the 2002 CENRAP emissions inventory. This projection assumed

¹ See 79 Fed. Reg. at 74,881, Tbls. 34-36 (Table 34 shows the greatest improvements at 0.135 and 0.149 deciview for Limestone Units 1 and 2, respectively, for the Wichita Mountains as against "average natural conditions").

² *Id.*

³ 77 Fed. Reg. 30,248, 30,256 (May 22, 2012); 77 Fed. Reg. 30,454, 30,464 (May 23, 2012).

a decrease of over 200,000 tons per year of SO₂ emissions from 2002 to 2018. More recent data show that SO₂ emissions have fallen much faster than were anticipated in 2002. EPA's most recent National Emissions Inventory shows that, by 2011, actual Texas SO₂ emissions were only 558,502 tpy, or 25% lower than the prior projection for 2018. Applying EPA's IPM projections indicates that 2018 emissions are now projected to be only 259,743 tpy SO₂, or 65% lower than the projection relied on by EPA's proposal.⁴

Had EPA used its own more recent emissions data and projections, the modeled impact of Texas sources on visibility impairment would have been significantly reduced, making clear that further controls are not needed to assure visibility protection. As a recent 9th Circuit decision made clear, EPA must use the most up-to-date data available in acting on state plans.⁵ Thus, EPA may not ignore the effect of this more recent data that implicates EPA's action on the Texas and Oklahoma regional haze plans.

c. Current haze measurements satisfy EPA's lower glide path.

EPA's own monitoring data show that haze levels in the Class I areas of concern are at or below even EPA's proposed lower 2064 glide path.

As explained in the attached report by Alpine Geophysics, in a comparison of the air quality monitoring data at the Class I areas in question to the Uniform Rate of Progress calculated by EPA in the current proposal, almost all of the observed data are below the Uniform Rate of Progress. These same observational data are also below EPA's projections for 2018 visibility impairment. This suggests that additional controls are not needed to achieve the regulatory targets EPA is proposing to set, as EPA continues to predict through the IPM model that visibility-impairing emissions will progressively decline through 2018.⁶

Though EPA's proposal suggests that observational data below the Uniform Rate of Progress line was the result of unusually favorable meteorology, the opposite is true. As explained in the Alpine report, available information on temperatures and precipitation suggests that years other than 2011 and 2012 were not unusually cool or wet, or otherwise conducive to low levels of haze.⁷ In fact, to the extent that the observed monitoring data slightly exceed the Uniform Rate of Progress for a particular year, the exceedance is associated with exceptional events that are not representative of typical air quality. For example, an unusually intense series of wildfires in Mexico appear to be responsible for the relatively high levels of haze observed at Big Bend in 2011, and a dust storm appears to be responsible for the haze observed at the Guadalupe Mountains in 2012.⁸

Taken together, these data show that further controls are not needed to protect visibility in the Class I areas at issue in this action.

d. EPA did not use an appropriate process to justify new controls.

EPA's proposed approach to assessing the impacts of Texas sources on visibility impairment departs from past regional haze actions and the agency's modeling guidance. In place of the accepted process, EPA's proposed approach relies on an *ad hoc* analysis unique to its action on Texas. EPA's analysis obscures the process of justifying the

⁴ Report of Gregory M. Stella, Alpine Geophysics LLC, *Professional Review of Texas Regional Haze FIP* (April 17, 2015) ("Alpine Report"), at 22-23, 26-27.

⁵ See *Sierra Club v. EPA*, 671 F.3d 955 (9th Cir. 2012) (rejecting an EPA SIP approval that relied on an emissions projection that had been superseded in the time between the state's submission and EPA's action).

⁶ Alpine Report at 7-9, 26-27.

⁷ Alpine Report at 23-25.

⁸ Alpine Report at 8, 11-22.

proposed new controls. This *ad hoc* decision making process renders EPA's proposed controls for Limestone Units 1 and 2 arbitrary and capricious, by introducing a series of compounding errors into the analysis that would have been avoided had EPA followed the accepted statutory process as EPA did in its actions on other states' plans. Problems with EPA's process as to Texas included:

i. EPA's use of source-specific analysis treats Texas sources differently from other states.

The proposal evaluates the reasonable progress goals for the relevant areas on the basis of source-by-source contributions to visibility impairment.

However, this approach exceeds what EPA can require of a state under the statute and regulations. Regional haze regulations establish a process and criteria to be considered in setting reasonable progress goals, but provide no mention of a source-specific analysis.⁹ By contrast, the regional haze program only calls for source-specific evaluations under the "reasonably attributable visibility impairment" program (for which EPA has proposed to approve Texas' plan) and the Best Available Retrofit Technology ("BART") program.

Source-specific analysis also has not been applied by EPA in practice in the reasonable progress context:

- EPA recently defended a state's reasonable progress goals that did not rely on a source-specific analysis, and prevailed before the court: "[W]e reject the environmental groups' argument that the EPA had to engage in a source-specific analysis for a reasonable-progress determination. Nothing in the Regional Haze Rule or the Clean Air Act required New Mexico to conduct a four-factor analysis of the Escalante plant."¹⁰
- EPA has repeatedly used interstate emission trading rules such as the Clean Air Interstate Rule ("CAIR") and the Cross-State Air Pollution Rule ("CSAPR") to satisfy reasonable progress goals.¹¹ As EPA is proposing to use CSAPR to satisfy Texas' BART obligations,¹² it would only be logical to also use CSAPR to satisfy Texas' reasonable progress obligations as well.

ii. EPA's evaluation lacks clear and objective metrics.

EPA's proposal does not identify a clear or objective basis on which EPA identified sources to target for new controls as part of this action.

EPA should identify such a basis, as EPA's own regulations and practice would require an implementing state to have such a threshold. For example, BART rules require use of such a threshold:

⁹ See generally 40 C.F.R. § 51.308.

¹⁰ *WildEarth Guardians v. EPA*, 770 F.3d 919, 944.

¹¹ 77 Fed. Reg. 38,515 (June 28, 2012) (Alabama); 77 Fed. Reg. 38,501 (June 28, 2012) (Georgia); 77 Fed. Reg. 19,098 (March 30, 2012) (Kentucky); 77 Fed. Reg. 71,533 (Dec. 3, 2012) (Michigan); 77 Fed. Reg. 38,185 (June 27, 2012) (North Carolina); 77 Fed. Reg. 38,509 (June 28, 2012) (South Carolina); 77 Fed. Reg. 24,392 (April 24, 2012) (Tennessee); 77 Fed. Reg. 16,937 (March 23, 2012) (West Virginia).

¹² 79 Fed. Reg. at 74,844.

One of the first steps in determining whether sources cause or contribute to visibility impairment for purposes of BART is to establish a threshold (measured in deciviews) against which to measure the visibility impact of one or more sources. . . .¹³

Once such a metric is set, it is a straightforward exercise to "compare the predicted visibility impacts with your threshold for contribution."¹⁴

Instead, EPA's proposal relies on a series of subjective and *ad hoc* decisions about which sources should make emission reductions and the level of reductions that should be made. Among the numerous steps that lacked clear explanation, EPA began by considering a small number of the numerous emissions sources in the state, investigated a smaller subset further without clear explanation, excluded approximately half of those sources based on a non-numerical assessment that their visibility impacts were low, then imposed an unprecedented "light extinction" threshold to exclude some (but not all) facilities below the threshold from controls. This approach does not reflect a reasonable application of the legal criteria applied to determinations of reasonable progress goals.

iii. EPA should have prepared a modeling protocol and made it available for public review and comment.

EPA did not provide a modeling protocol for public notice and comment as part of its proposal. A modeling protocol is the means to detailing and formalizing the procedures for conducting a modeling study. In this context, a protocol would help to ensure that sources are identified consistently for potential regulation.

EPA would certainly have required a state issuing such a plan to provide a modeling protocol. Notably, EPA's regional haze modeling guidance recommends that states prepare such a modeling protocol in submitting a regional haze plan to EPA.¹⁵ Thus, to comply with this guidance, EPA would need to make available its own modeling protocol for public review. Similarly, EPA's BART rules require the use of a modeling protocol: "There are several steps for making an individual source attribution using a dispersion model: 1. Develop a modeling protocol."¹⁶ And, "[I]f you wish to use a grid model, you should consult with the appropriate EPA Regional Office to develop an appropriate modeling protocol."¹⁷

In this instance, development of a modeling protocol for this action would have facilitated stakeholder participation in the evaluation of potential sources of visibility impairment and reduced the risk of EPA relying on outdated emissions information.

It is inappropriate for EPA to fail to provide a modeling protocol where EPA's own regulations and practice would require an implementing state to use a modeling protocol. In this instance, EPA's method to identify sources to regulate appears to lack such a consistent basis.

e. TCEQ properly relied on aggregate visibility benefits analysis to determine that available controls were not reasonable.

EPA has proposed to disregard Texas' determination that available controls to reduce regional haze were not reasonable because Texas considered aggregate costs and visibility

¹³ 40 C.F.R. Pt. 51, Appx. Y, § III.A.1.

¹⁴ 40 C.F.R. Pt. 51, Appx. Y, § III.A.3, Option 1.

¹⁵ Alpine Report at 31-33.

¹⁶ 40 C.F.R. Pt. 51, Appx. Y, § III.A.3, Option 1.

¹⁷ 40 C.F.R. Pt. 51, Appx. Y, § III.A.3, Option 3.

benefits. "We propose to find that the TCEQ's analysis is insufficient to determine the visibility benefit TCEQ's reliance on an aggregate analysis materially affected its conclusion that existing and scheduled controls would achieve reasonable progress."¹⁸

The Texas approach is consistent with "option 3" identified in EPA's regulations for demonstrating that no sources in a state should be subject to BART, which states:

You may also submit to EPA a demonstration based on an analysis of overall visibility impacts that emissions from BART-eligible sources in your State, considered together, are not reasonably anticipated to cause or contribute to any visibility impairment in a Class I area, and thus no source should be subject to BART.¹⁹

EPA's underlying analysis makes clear that BART was the agency's template for doing its analysis. Among the numerous comparisons and references to BART rules, one of EPA's technical support documents states:

Our Reasonable Progress Guidance notes the similarity between some of the reasonable progress factors and the BART factors contained in section 51.308(e)(1)(ii)(A), and suggests that the BART Guidelines be consulted regarding cost, energy and non-air quality environmental impacts, and remaining useful life. We are therefore relying on our BART Guidelines for assistance in interpreting those reasonable progress factors as applicable.

. . . . Also, similar to a BART analysis, we are considering the projected visibility benefit in our analysis.²⁰

Not only was the Texas approach consistent with other EPA regional haze regulations, it also resulted in the objectively reasonable conclusion that substantial new controls with imperceptible visibility impacts are unreasonable. Texas determined what visibility benefits might accrue from new SO₂ control strategies, and that the maximum projected visibility benefit was only 0.36 deciview, which could not be perceived by the human eye.²¹

Thus, NRG disagrees with EPA's proposed rejection of Texas' reliance on an aggregate cost and visibility benefit analysis.

f. EPA's proposed emission reductions are unreasonable in light of the role of international emissions in visibility impairment.

Though not considered by EPA in this proposal, EPA's most up-to-date international emissions estimates illustrate the unreasonableness of targeting Texas electric generating units in an effort to reach natural visibility conditions. As described in the attached Alpine Geophysics report, CENRAP's Particulate Matter Source Apportionment Technology ("PSAT") modeling analysis indicates that emissions from Mexico and other countries south of the U.S. contribute 52% of the visibility impairment at Big Bend and 25% of the visibility impairment at the Guadalupe Mountains. By comparison, the same PSAT results suggest

¹⁸ 79 Fed. Reg. at 74,841.

¹⁹ 40 C.F.R. Pt. 51, Appx. Y, § III.A.3, Option 3.

²⁰ EPA, *Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD)* (Nov. 2014), at 6.

²¹ EPA, *Technical Support Document for the Texas Regional Haze State Implementation Plans (TX TSD)* (Nov. 2014), at 15.

that the overall contribution of Texas electric generating units is less than 5% at each area. Further, Texas sources' relative contributions are expected to shrink in the future at the same time that the international contribution rises. Even as Texas SO₂ emissions decline in the next few years, EPA has projected that SO₂ emissions from Mexico will increase by 26% from 2012 to 2030.²²

These data show that, even if all Texas impacts were eliminated, improvements could not be assured because the remaining Texas impacts to target are so much smaller than international impacts. Thus, considering the minuscule impact of Texas electric generating units on these areas, and the substantial and growing impacts of international sources, it is unreasonable for EPA to impose stringent new emission limitations on Limestone Units 1 and 2 to achieve reasonable progress. EPA has already agreed with this principle, as expressed in the 1999 Federal Register preamble to the regional haze rules:

Commenters expressed concerns that EPA should take into account that States are not able to control international sources in reviewing a State's proposal for a reasonable progress target. . . .

The EPA agrees that the projected emissions from international sources will in some cases affect the ability of States to meet reasonable progress goals. The EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international sources in their regional haze programs, particularly in cases where it has already been well documented that such sources are important.²³

g. Consultation issues do not provide a basis for EPA to disapprove the Wichita Mountains reasonable progress goals.

In addition to the considerations above (which apply to all Class I areas at issue in this proposal), EPA has identified an alleged consultation deficiency as a reason to disapprove the Wichita Mountains reasonable progress goals. As explained below, consultation circumstances do not justify EPA's proposed disapproval and FIP.

i. EPA cannot disapprove the plans on the basis of a new interpretation that is contrary to the plain language of EPA regulations on state consultations.

EPA has proposed to interpret its rules at 40 C.F.R. §§ 51.308(d)(3) to effectively require states such as Texas to guess correctly as to whether EPA will in the future disagree with another state's long-term strategy.²⁴ This proposed interpretation is also part of the basis for EPA's proposed disapproval of Texas' plan.

NRG does not agree with this interpretation, as it is contrary to the plain language of the regulations, as described in the following table:

Rule	Plain Meaning	EPA Proposed Interpretation
40 C.F.R. § 51.308(d)(1)(iv): "(1) Reasonable progress	The state containing the Class I area, which is	"[A]s a corollary to Section 51.308(d)(1)(iv), upwind

²² Alpine Report at 28-31.

²³ 64 Fed. Reg. 35,714, 35,736 (Jul. 1, 1999)

²⁴ 79 Fed. Reg. at 74,828-30.

goals. For each mandatory Class I Federal area located within the State, the State must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions. . . (iv) In developing each reasonable progress goal, the State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area."	responsible for setting the reasonable progress goal, must consult with upwind states that might affect the Class I area. The regulation that calls for upwind states to initiate consultation in furtherance of "coordinated emission management strategies" (40 C.F.R. § 51.308(d)(3)(i)) only applies once the reasonable progress goal has been set.	states 'must consult with [downwind] ²⁵ State(s) in order to develop coordinated management strategies."
40 C.F.R. § 51.308(d)(3)(ii) (emphasis added): "Where other States cause or contribute to impairment in a mandatory Class I Federal area, the State must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the <i>progress goal</i> for the area."	The term "progress goal" refers to the reasonable progress goal established by the state containing the Class I area, per subsection 51.308(d)(1) which provides that "For each mandatory Class I Federal area located within the State, the State must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions." The statute and regulations do not provide that a state must guess what an "approved or approvable" reasonable progress goal would be beyond the plain meaning of EPA's rules.	"[W]e interpret the term 'progress goal' in Section 51.308(d)(3)(ii) as an <i>approved or approvable</i> progress goal." ²⁶

The proposed interpretations offered by EPA appear calculated to provide a basis for EPA to disregard the Texas-Oklahoma consultations that underlie this action, including the Wichita Mountains reasonable progress goals. However, they are contrary to the plain language of the rules themselves.

Notably, EPA can point to no flaw in the consultations between Texas and Oklahoma other than EPA's subjective determination that the consultations did not result in the same suite of emission controls that EPA now plans to impose. The distinguishing feature of such an analysis is the proposed insertion of extra-statutory and extra-regulatory requirements, developed only for the Texas action, such as "coordinated management strategies" and

²⁵ The "downwind" brackets appear in EPA's preamble.

²⁶ 79 Fed. Reg. at 74,829.

"approved or approvable" goals. In fact, the required consultations occurred, as described in EPA's Federal Register notice.²⁷ Thus, inadequacy of consultation does not provide a basis for EPA's action.

ii. Texas and Oklahoma consulted as required on the reasonable progress goals for the Wichita Mountains.

Texas and Oklahoma met the consultation requirements of EPA's rules. EPA's preamble documents the communications between the states' agencies, concluding with a succinct description of facts indicating that the states agreed on the key point of the reasonable progress goal for the Wichita Mountains:

The TCEQ concluded by requesting ODEQ's concurrence on that assessment, and, "that your State is not depending on any additional reductions from Texas sources in order to meet your reasonable progress goal(s)."

On May 12, 2008, the ODEQ responded to that letter and concurred with the "information in that letter."²⁸

This record makes it clear that Texas and Oklahoma consulted. EPA's regional haze regulations require states to consult with each other, as they did, but do not require the states to consult with EPA:

In developing each reasonable progress goal, the State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area. In any situation in which the State cannot agree with another such State or group of States that a goal provides for reasonable progress, the State must describe in its submittal the actions taken to resolve the disagreement. In reviewing the State's implementation plan submittal, the Administrator will take this information into account in determining whether the State's goal for visibility improvement provides for reasonable progress towards natural visibility conditions.²⁹

By dismissing the states' consultation, EPA's proposed disapproval of the Wichita Mountains reasonable progress goal is inconsistent with the process described by EPA's own regulations. EPA must accept the reasonable progress goals identified by Texas and Oklahoma for the Wichita Mountains.

h. EPA has already approved less stringent reasonable progress goals using the same data that is at issue for the Guadalupe Mountains.

To assure consistency with EPA's prior action on New Mexico's regional haze plan, EPA must approve Texas's 2018 reasonable progress goals for the Guadalupe Mountains.

The monitoring data used to determine baseline and natural visibility conditions for the Guadalupe Mountains are the same dataset that was used to determine baseline and natural visibility conditions for the nearby Carlsbad Caverns area in New Mexico. However, in approving New Mexico's regional haze plan, EPA required the State to plan for achieving a

²⁷ 79 Fed. Reg. at 74,854.

²⁸ 79 Fed. Reg. at 74,855.

²⁹ 40 C.F.R. § 51.308(d)(1)(iv).

less stringent degree of visibility improvement by 2018. A comparison of the Texas and New Mexico reasonable progress targets and associated visibility improvement appears in the following table:

Texas and New Mexico Reasonable Progress Goals Based on Data from Guadalupe Mountains Monitoring Site		
	Guadalupe Mountains (Texas, proposed for disapproval) ³⁰	Carlsbad Caverns (New Mexico, approved by EPA) ³¹
Baseline visibility conditions, 20% worst days	17.19 deciviews (dv)	17.19 dv
State's reasonable progress target for 2018, 20% worst days	16.3 dv	16.92 dv
Visibility improvement required by 2018, 20% worst days	0.9 dv	0.27 dv
Baseline visibility conditions, 20% best days	5.9 dv	5.95 dv
State's reasonable progress target for 2018, 20% best days	5.7 dv	6.12 dv
Visibility improvement required by 2018, 20% best days	0.2 dv	-0.17 dv (visibility allowed to deteriorate on 20% best days)

As shown in the comparison above, the 2018 Texas reasonable progress goals for the Guadalupe Mountains are more stringent than the New Mexico goals that EPA approved for the adjacent Carlsbad Caverns area. Thus, EPA is proposing to reject a visibility improvement target that exceeds the improvements that EPA required of New Mexico under the same baseline conditions at the same monitoring site. This result would be incoherent and inconsistent with EPA regulations requiring the agency to assure consistency of decision making through the "fair and uniform application by all Regional Offices of the criteria, procedures, and policies employed in implementing and enforcing the act."³²

³⁰ 79 Fed. Reg. at 74,833.

³¹ See 77 Fed. Reg. 36,044, 36,071 (June 15, 2012) (finalized at 77 Fed. Reg. 70,693 (Nov. 27, 2012)).

³² 40 C.F.R. § 56.3(a).

3. EPA should defer to Texas' determination of natural visibility conditions, natural visibility impairment, and the uniform rate of progress for the Big Bend and Guadalupe Mountains areas.

a. EPA's proposal and its effect.

EPA has proposed to disapprove Texas' findings on the natural visibility conditions for Big Bend and Guadalupe Mountains on the basis of "significant uncertainty in the assumptions used in the Texas methodology and the demonstrated sensitivity to the assumption of 100% natural versus 80% soil and coarse mass from natural sources."³³ Because the natural visibility conditions are a factor in the natural visibility impairment and uniform rate of progress determinations, EPA has also proposed to disapprove Texas' findings on those two metrics.³⁴

Instead, EPA proposes to recalculate the natural visibility conditions using a default value. This results in a lower estimate of visibility impairment under natural visibility conditions, which in turn tends to require faster improvements in visibility through 2064. A comparison of the effect of EPA's proposal can be seen in Figures 2 and 3 in the attached report by Alpine Geophysics, LLC.³⁵

NRG disagrees with EPA's proposal to override Texas' findings on natural visibility conditions and the associated metrics for Big Bend and the Guadalupe Mountains, for the reasons stated below.

b. Uncertainty does not justify the disapproval and replacement with a default value.

EPA's only stated basis for disapproving the Texas findings on natural visibility conditions and related metrics is "uncertainty" relating to what amount of "soil and coarse mass" detected at air monitoring sites is attributable to natural sources.³⁶ At the same time, EPA notes in one of its supporting technical analysis that:

The TCEQ has provided data that supports the conclusion that a large portion of dust impacting visibility at its Class I areas is likely due to natural sources. We agree that dust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method. However, we do not believe, as the TCEQ asserts, that all coarse mass and soil can be attributable to 100% natural sources.³⁷

EPA's alternative is a default metric that assumes that none of the soil and coarse mass is attributable to natural sources. However, this default approach is unreasonable because it conflicts with EPA's acknowledgment, quoted above, that natural sources

³³ 79 Fed. Reg. at 74,831-32.

³⁴ See 79 Fed. Reg. at 74,832-33 ("We have reviewed the TCEQ's estimates of the natural visibility impairment at Big Bend and the Guadalupe Mountains and we propose to disapprove these estimates because this calculation depends on the TCEQ's calculations for natural visibility conditions. . . . [W]e propose to find the TCEQ has calculate this [uniform] rate of progress on the basis of, and compared baseline visibility conditions to, a flawed estimation of natural visibility conditions for the Big Bend and Guadalupe Mountains, as we describe above. Therefore, we propose to disapprove the TCEQ's calculation of the URP needed to attain natural visibility conditions by 2064.").

³⁵ Alpine Report at 8-9.

³⁶ 79 Fed. Reg. at 74,831.

³⁷ FIP TSD at 32.

contribute substantially to the observed visibility impairment at Big Bend and the Guadalupe Mountains.

Further, EPA has recognized that Texas already addressed the concern that its approach might overestimate visibility impacts from natural sources, because "to the extent its assumption that 100% of coarse mass and fine soil is natural is an overestimate, it [TCEQ] expects that its low organic carbon estimate will more than compensate for any errors in this assumption at this time."³⁸ EPA's method by contrast would not appropriately compensate for natural contributions to visibility impairment.

In summary, EPA has rejected a reasoned and logical approach to calculating natural visibility conditions by Texas, substituting for it a default value that EPA admits will have the effect of requiring Texas to improve visibility beyond natural conditions.

4. Scrubber upgrades on NRG's plants would be unreasonable.

EPA has proposed to require scrubber upgrades at two of NRG's assets, Units 1 and 2 at the Limestone power plant.³⁹ As indicated throughout these comments, NRG does not agree that additional SO₂ controls on these units are warranted to address regional haze. Further, EPA's proposed SO₂ emission rate for Limestone would be inappropriate, because it would not meaningfully improve visibility and relies on an erroneous cost-effectiveness analysis. NRG requests that EPA withdraw its proposed SO₂ emission rate for the Limestone plant.

In addition, NRG supports the exclusion of the W.A. Parish plant from EPA's proposed SO₂ emission limits for similar reasons. NRG disagrees that emission reductions from the Parish plant would be cost-effective from a visibility improvement perspective.

a. EPA's analysis suggests that there would be no meaningful visibility improvement to scrubber upgrades at the Limestone plant.

Scrubber upgrades at Limestone would not meaningfully improve visibility even if EPA's analysis were taken at face value. EPA's modeling results suggest that upgrading the Limestone units' scrubbers to achieve 95% control would result in a visibility change of no more than 0.284 deciview compared to what EPA has described as average natural conditions, and no more than 0.057 deciview compared to EPA's projection for 2018.⁴⁰ Such deciview changes are imperceptible to the human eye, as a single (1.0) deciview is the lowest level of visibility change that the human eye can detect.

b. Actual visibility changes associated with scrubber upgrades at Limestone will be lower than EPA's projections.

Even the minuscule visibility changes described in EPA's proposal are overstated, as they rely on an assumed emission rate of 0.08 lbs SO₂/MMBtu from each of the Limestone units. As documented in the attached confidential report by Sargent & Lundy, it is not reasonable for EPA to require the units to achieve the proposed 0.08 rate on the basis of a scrubber upgrade. Any visibility improvement attributed to the scrubber upgrade would need to be based on a higher limit that reflects the constraints imposed by the current design and arrangement of the existing scrubbers and expected increases in the sulfur content of the plant's fuel supply, as described in the attached confidential report by

³⁸ 79 Fed. Reg. at 74,831.

³⁹ 79 Fed. Reg. at 74,884.

⁴⁰ See 79 Fed. Reg. at 74,883.

Sargent & Lundy.⁴¹ Thus, scrubber improvements at Limestone would achieve far lesser reductions than EPA has estimated, further diminishing the already-imperceptible visibility changes that EPA has modeled in support of the proposed new limits.

c. Limestone scrubber upgrades would not be cost-effective.

In addition to being minuscule, the visibility improvements that EPA proposes to require with scrubber upgrades at Limestone 1 and 2 would not be cost-effective. As documented in the attached confidential report by Sargent & Lundy, EPA's cost-effectiveness analysis greatly understates the annual capital and operating cost of the scrubber upgrades that EPA is proposing to mandate. The estimated actual cost-effectiveness, based on a preliminary analysis, is projected to be \$2,579 per ton, or more than 16 times that projected by EPA.⁴² The real costs, which would need to be based on a more extensive engineering analysis, could be far higher. Accordingly, EPA's cost-effectiveness analysis is dramatically overstated as to Limestone, making the cost per deciview of visibility improvement unreasonable.

d. Additional time would be needed to upgrade scrubbers at Limestone.

The attached confidential report by Sargent & Lundy indicates that significant modifications would be required to the existing Limestone plant scrubbers to achieve substantially lower SO₂ emission rates. Such modifications would likely include new dampers, modifications to existing duct work and spray towers, replacement of induced-draft fans, and reheat system upgrades or new chimneys. Therefore, to accommodate the detailed engineering analysis, procurement of long lead-time items such as fans, demolition or renovation of existing equipment followed by installation and commissioning of the new systems, additional time beyond EPA's proposed 3 year implementation may be required. If EPA requires upgraded SO₂ controls at Limestone to address regional haze, NRG requests that the compliance date for be set 42 months following the effective date of the rule such that the outages necessary to complete the modifications can be scheduled following the 2018 summer peak period.

e. Controls should not be required for the Parish plant.

NRG supports EPA's proposed exclusion of the Parish plant from new SO₂ limits under this proposal for similar reasons as apply to Limestone:

- Even if new scrubbers were installed at three units and the existing scrubber upgraded at the Parish plant, these controls would only achieve a 0.361 deciview improvement as compared to average natural conditions,⁴³ far less than the eye can detect.
- The projected visibility improvement from new and upgraded SO₂ controls at Parish under EPA's projected 2018 emissions inventory would be significantly lower, at 0.071 deciview.
- Actual costs of increasing SO₂ control at the Parish plant are significantly higher than EPA's estimates. While NRG did not commission an engineering analysis similar to that performed on the Limestone scrubbers, we note that EPA's cost effectiveness analysis for W. A. Parish was incomplete and omitted necessary capital and operating and maintenance costs.

⁴¹ Sargent & Lundy LLC, *S&L Comments to EPA Assessment of Limestone FGD Capability* (Apr. 15, 2015) ("Sargent & Lundy Report"), at 9.

⁴² Sargent & Lundy Report at 17.

⁴³ 79 Fed. Reg. at 74,881 & Tbl. 34.

Thus, NRG does not agree that new and upgraded SO₂ controls at Parish would be cost-effective.

5. EPA should not disapprove NAAQS infrastructure SIPs as part of this action.

EPA has proposed in part to disapprove past Texas "infrastructure" SIP submittals for several national ambient air quality standards ("NAAQS") on the basis that, in EPA's view, they do not adequately prevent Texas sources from impairing visibility in other states.⁴⁴ Because these proposed disapprovals rest on the same reasoning as EPA's disapproval of Texas' regional haze plan, the proposed infrastructure SIP disapprovals also must not be finalized.

6. EPA's action is reviewable in the 5th Circuit.

EPA has proposed to determine that its action is only reviewable in the D.C. Circuit, on the basis that:

[T]his rule is based on a determination of nationwide scope and effect. The rule discusses our interpretation of multiple provisions of the Regional Haze Rule and explains how those provisions operate in the visibility-transport context. Our interpretation of our regulations is applicable to all states, not just Texas and Oklahoma.⁴⁵

NRG does not agree that this action is reviewable in the D.C. Circuit. The Clean Air Act provides that a petition for review of "a locally or regionally applicable" EPA action "may be filed only in the United States Court of Appeals for the appropriate circuit" unless it "is based on a determination of nationwide scope or effect."⁴⁶ Further, if EPA's proposed finding on judicial review were correct, no state implementation plan challenge would ever lie outside the D.C. Circuit, despite the statute's role for other Circuits and the substantial history of past decisions on state plans that have been determined in the various Circuits.

Our reasoning is further explained below.

a. The proposal is locally or regionally applicable.

The "locally or regionally applicable" nature of EPA's action is made clear by the fact that the proposal would only impose new emission controls on a small number of facilities in Texas. A further indication that the action is "locally or regionally applicable" is that it only regulates three out of over 100 areas subject to the statutory provisions on regional haze.⁴⁷ Also notably, the proposed rule was signed by EPA's Region 6 Regional Administrator Curry, based in Dallas, not by Administrator McCarthy in Washington, D.C.

b. The proposal does not rely on a determination of nationwide scope and effect.

NRG also disagrees that the proposal relies on "a determination of nationwide scope and effect." Rather, the proposal concerns the application of national regulations to fact-specific circumstances at a small number of emissions sources and protected areas.

⁴⁴ 79 Fed. Reg. at 74,892 (proposed 40 C.F.R. § 52.2304(d)-(e)).

⁴⁵ 79 Fed. Reg. at 74,888.

⁴⁶ 42 U.S.C. § 7607(b)(1).

⁴⁷ See, e.g., http://www.epa.gov/ttn/oarog/t1/fr_notices/classimp.gif (last accessed April 2, 2015).

Courts outside the D.C. Circuit have frequently exercised jurisdiction over challenges to EPA regional haze rules that address specific states. For example:

- In October 2014, the 10th Circuit rejected on the merits a challenge by environmental groups to EPA's approval of a three-state emissions trading program to satisfy regional haze rule requirements.⁴⁸
- In July 2014, the 9th Circuit rejected on the merits a challenge by environmental groups to EPA's approval of BART determinations for sources in Nevada.⁴⁹
- In September 2013, the 8th Circuit issued an opinion on the merits on BART and reasonable progress plan issues for North Dakota.⁵⁰

EPA's litigation position subsequent to the current proposal further illustrates the distinction between this action, reviewable in the 5th Circuit, and other regional haze actions for which judicial review may lie in the D.C. Circuit. On January 30, 2015, EPA filed a brief with the 8th Circuit concerning a challenge to the Minnesota regional haze plan. EPA's rationale as presented to the court was that the Minnesota lawsuit was a collateral attack on the substance of a prior nationwide EPA rule finding that EPA-promulgated emissions trading programs were superior to BART for regional haze purposes, as EPA had merely approved Minnesota's reliance on the EPA emissions trading program.⁵¹

By contrast to the Minnesota lawsuit, NRG's objections to EPA's current proposal do not contradict EPA's underlying regional haze rules. These objections are fact-specific to how EPA's regulations should be applied to Texas sources. Thus, the current proposal is exemplary of the type of "locally or regionally applicable" action for which judicial review lies in the 5th Circuit.

* * *

NRG appreciates your consideration of these comments. Please contact me at 832-357-5288 or Craig Eckberg at 832-357-5291 if you have any questions or require additional information.

Sincerely,



Ben Carmine
Regional Environmental Director
NRG Texas Power LLC

Attachments(2)

⁴⁸ *WildEarth Guardians v. EPA*, 770 F.3d 919 (10th Cir. 2014).

⁴⁹ *WildEarth Guardians v. EPA*, 759 F.3d 1064 (9th Cir. 2014).

⁵⁰ *North Dakota v. EPA*, 730 F.3d 750 (8th Cir. 2013).

⁵¹ January 30, 2015 brief of EPA, *National Parks Conservation Association v. EPA*, Nos. 12-2910, 12-3481 (8th Cir.).

Attachments

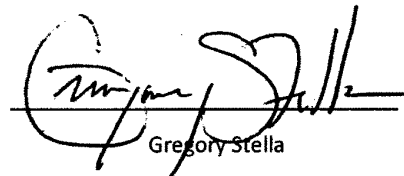
- A. Report of Gregory M. Stella, Alpine Geophysics LLC, *Professional Review of Texas Regional Haze FIP* (April 17, 2015) ("Alpine Report").
- B. Sargent & Lundy LLC, *S&L Comments to EPA Assessment of Limestone FGD Capability* (Apr. 15, 2015) ("Sargent & Lundy Report") - submitted as a confidential appendix per 40 C.F.R. Part 2.

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Report of Gregory M. Stella, Alpine Geophysics LLC

Prepared for NRG Energy

Professional Review of Texas Regional Haze FIP

A handwritten signature in black ink, appearing to read 'Gregory Stella', is written over a horizontal line.

Gregory Stella

April 17, 2015

Alpine Document ID TS-463.6

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Summary of Conclusions

My name is Gregory Stella. I am currently a Managing Partner of Alpine Geophysics, LLC, ("Alpine") a firm that offers highly specialized research and engineering services in the atmospheric sciences.

From 1997 until 2003, I served as an emissions and modeling specialist at the U.S. Environmental Protection Agency ("EPA" or "Agency"), Office of Air Quality Planning and Standards, where I managed and prepared the emission inventories, control strategies, and associated temporal, spatial and speciation data for the Regional Transport NOx SIP Call, Section 126 rulemaking, Tier-2 tailpipe standards, 1-hour attainment demonstrations, Heavy-Duty Diesel Engine standards, Multi-Pollutant legislation, Clear Skies Analysis, and US/Canadian Air Quality Agreements. For my efforts while at EPA, I received two U.S. EPA Gold Medals, for the NOx SIP Call Rulemaking (1999) and the Tier-2 Tailpipe Standard (2001) as well as a U.S. Department of Justice Certificate of Commendation for working with the Environment and Natural Resources Division (2000) and multiple Bronze Medals for Commendable Service.

Since 2003, I have been with Alpine where I am internationally recognized as a technical authority in the planning, design, development, evaluation, application, and modeling of local, national, and international emission inventories and policy options used for the projection and control of ozone and particulate matter pollutants and precursors. I have coordinated with Federal, State, Regional, Local, International, Tribal, and private workgroups, modeling centers, and stakeholders to develop, evaluate, and apply alternative control measures and control program designs in support of emissions and air quality analyses.

In September 2011, I was invited by and provided testimony before the U.S. House of Representatives Committee on Space, Science and Technology regarding work conducted by Alpine in modeling the Cross-State Air Pollution Rule, including a discussion of analyses related to recent technological and air quality changes, and corresponding attainment results for federal ozone and particulate matter standards. Additionally, in October 2006, I presented information in Beijing, China to the Task Force on Hemispheric Transport of Air Pollutants under the Convention on Long-Range Transboundary Air Pollution relevant to national efforts to assess the impacts of intercontinental transport.

Specific to this review, in 2006, I was part of the Alpine team that was contracted to assist the Central Regional Air Planning Association's ("CENRAP") Implementation and Control Strategies Workgroup with developing a quantitative procedure to identify and prioritize potential regional haze control strategies to be tested by CENRAP modelers. Alpine formulated a methodology for constructing control strategy recommendations based on information current at that time. Using the results of CENRAP visibility projection modeling together with then current information on the composition of visibility-impairing fine particulate aerosols at 22 Class I monitors, Alpine identified residual visibility progress 'increments' that potentially required additional regional and/or subregional emission reductions to achieve visibility goals.

I have been asked by NRG Energy to provide an expert review of EPA's assumptions and visibility modeling related to the Agency's proposed rule "Approval and Promulgation of Implementation Plans;

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Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan To Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility” (79 FR 74817).

Based on my review of EPA’s preamble, I conclude the following:

- EPA’s proposal appears to ignore actual data showing that the Big Bend, Guadalupe Mountains, and Wichita Mountains Class I areas are on a glide slope to attaining natural visibility conditions by 2064.
- TCEQ’s method for calculating natural background visibility is reasonable. Additionally, EPA has not adequately demonstrated that the 80% natural source composition default value is more appropriate than TCEQ’s 100% value at these specific Class I areas.
- The modeling utilized by EPA to support the proposed rule was based on emission estimates that are out of date and demonstrated to be erroneously high.
- EPA failed to follow its own regional haze modeling guidance in the following ways:
 - EPA’s approach to evaluating visibility impacts lacked an objective, documented significance test, and
 - EPA failed to publish a supporting modeling protocol.

After reviewing these facts, it is clear that EPA’s action to partially disapprove Texas’ State Implementation Plan (“SIP”) is not supportable based on the data and methods used to back their decision.

Summary of EPA FIP Proposed Rule (79 FR 74817)

The EPA is proposing to partially approve and partially disapprove a revision to the Texas State Implementation Plan received from the State of Texas on March 31, 2009, that addresses regional haze for the first planning period from 2008 through 2018. This SIP revision was submitted to address the requirements of the Clean Air Act (“CAA”) and EPA’s rules that require states to prevent any future, and remedy any existing, manmade impairment of visibility to assure reasonable progress toward the national goal of achieving natural visibility conditions in Class I areas. The EPA is proposing to partially approve this SIP revision as meeting certain requirements of the regional haze program, including the majority of the requirement to procure and install the Best Available Retrofit Technology (“BART”) at certain categories of existing major stationary sources built between 1962 and 1977.

The EPA is also proposing to partially disapprove the SIP revision for not adequately addressing other requirements of the regional haze program related to reasonable progress, the long-term strategy, and the calculation of natural visibility conditions. The EPA is also proposing to disapprove SIP revisions submitted by Texas for the purpose of addressing the requirements of the CAA regarding interference with other states’ programs for visibility protection for the 1997 fine particulate matter (“PM_{2.5}”) National Ambient Air Quality Standards (“NAAQS”), the 1997 ozone NAAQS, the 2006 PM_{2.5} NAAQS, the 2008 ozone NAAQS, the 2010 Nitrogen Dioxide NAAQS, and the 2010 Sulfur Dioxide (“SO₂”) NAAQS.

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The EPA is proposing a Federal Implementation Plan ("FIP") for Texas to remedy certain matters that EPA perceives as deficiencies in the SIP. The proposed FIP would implement SO₂ emission limits on fifteen Texas sources as part of a long-term strategy for making reasonable progress at three Class I areas in Texas and Oklahoma, sets new RPGs for the Big Bend, the Guadalupe Mountains, and Wichita Mountains Class I areas, and substitutes Texas' reliance on the Clean Air Interstate Rule ("CAIR") to satisfy BART requirements at its EGUs with reliance on CAIR's successor, the Cross-State Air Pollution Rule ("CSAPR").

EPA's Plan to Disapprove Texas' Reasonable Progress Goals

In the EPA proposed rule notice, the Agency indicated their intention to disapprove Texas' Reasonable Progress Goals ("RPGs") for 2018 on the 20-percent least impaired ("B20%") and 20-percent most impaired ("W20%") days for the Big Bend ("BIBE") and Guadalupe Mountains ("GUMO") Class I areas. They further propose to find that the state has not demonstrated that its RPGs provide for reasonable progress towards meeting the national visibility goal.

Additionally, EPA identified the near-Texas Class I area of Wichita Mountains Wilderness ("WIMO")¹ and calculated day-specific visibility impacts finding that the 2018 progress goals on the W20% days are not reached at all three identified Class I areas (Figure 1).

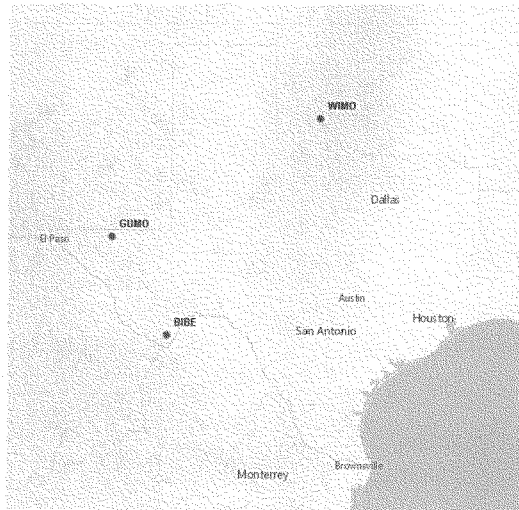


Figure 1 - Locations of Texas and near-Texas Class I areas.

¹ EPA-R06-OAR-2014-0754-0010

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Observed Visibility Trends Show Marked Improvement

As is demonstrated in the following table and figures, using both the most recent five-year (2009-2013) average conditions for the 20% worst days and individual annual conditions for these same days, monitoring data indicates that Big Bend and Wichita Mountains are currently observed to be below the EPA calculated uniform rate of progress line and Guadalupe Mountains has recently maintained observations below EPA modeling predictions. This further demonstrates that Texas is showing reasonable progress towards meeting the national visibility goals at these Class I areas.

Shown in Table 1 and Figures 2 through 4 below, recent observations (black dots in Figures 1, 2, and 3) from these Class I areas indicate significant progress during the W20% days has been made and at levels significantly more pronounced than EPA's modeling predicts (orange slope in Figures 1, 2, and 3).

By EPA's own admission,

"(w)e believe that this observed improvement from the baseline conditions is the result of meteorological conditions, reduction in the impacts from SO₂ emissions, and a reduction in the impacts from coarse material. More recent emission inventory data shows reductions in emissions in most states beyond what was projected in the 2018 modeling, including large reductions in emissions from the Eastern United States. Emissions from non-EGU Texas point sources are lower than have been projected in the modeling." (79 FR 74843).

"(w)e also note the more recent IMPROVE monitored data at the Big Bend and Guadalupe Mountains indicate that more progress than anticipated by the CENRAP modeling has occurred." (79 FR 74843)

Table 1 - Annual glide path and observed haze index (dv) at Big Bend (BIBE), Guadalupe Mountains (GUMO), and Wichita Mountains Wilderness (WIMO) Class I areas for worst 20% visibility days. Highlighted values indicate exceptional event influence.

		Haze Index (deciview) - 20% Worst Visibility Days									
Class I Area		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
BIBE	Glide Path	17.30	17.13	16.96	16.79	16.62	16.46	16.29	16.12	15.95	15.78
	Observed	16.51	18.17	16.87	17.35	16.10	14.95	16.47	19.02	15.70	15.29
GUMO	Glide Path	17.19	17.01	16.84	16.66	16.49	16.31	16.14	15.96	15.79	15.61
	Observed	15.57	17.46	15.27	15.72	16.75	14.07	13.70	16.39	15.12	17.25
WIMO	Glide Path	23.81	23.54	23.27	23.00	22.72	22.45	22.18	21.91	21.64	21.37
	Observed	24.23	25.68	21.83	22.80	21.55	#N/A	21.69	22.91	20.17	20.14

Furthermore, for Guadalupe Mountains and Wichita Mountains, observed condition trends for the worst 20% visibility days fall below the EPA calculated uniform rate of progress (ROP) line through 2013, not just the predicted and modeled visibility values.

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It is recognized that Big Bend National Park, which while demonstrating an observational trend lower than EPA's CAMx predicted values, exhibits a trend higher than EPA's calculated uniform ROP line for the Class I area. This measured condition trend is considerably impacted by the 2011 W20% haze index value and can be linked to significant smoke events resulting from the record wildfire season in 2011 in the southwestern US and Mexico².

It is further recognized that during the two recent highest years' of haze index observations (2011 for Big Bend, Wichita Mountains and Guadalupe Mountains and 2013 for Guadalupe Mountains), these monitors also had significantly high 'exceptional' event influences represented with a high wildfire year reported in the southern U.S. and northern Mexico domains in 2011 and episodic high dust storms reported during poor visibility days near Guadalupe Mountains in 2013, both contributing to the increased haze index observations, likely more than meteorology.

In Figures 2 through 4, these impacted W20% observation calculations are highlighted as red dots in 2011 and 2013.

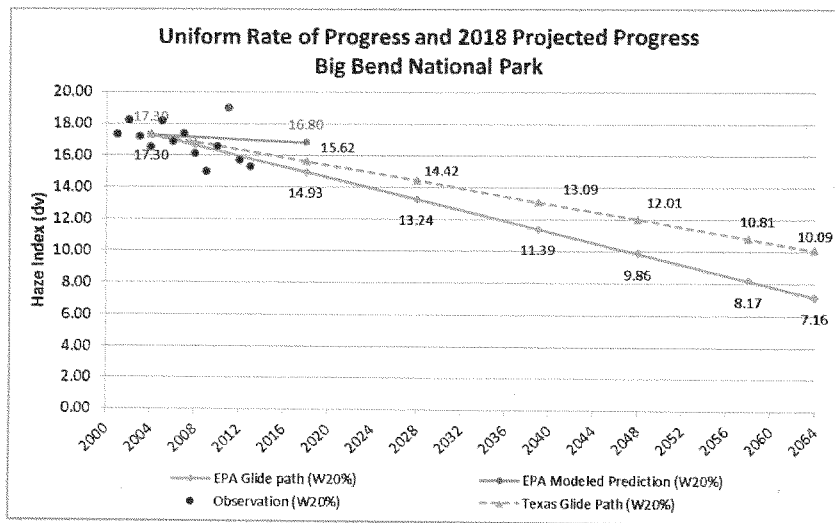


Figure 2 - Observed and predicted W20% haze index values for Big Bend National Park.

² <http://www.ncdc.noaa.gov/sotc/fire/2011/13>

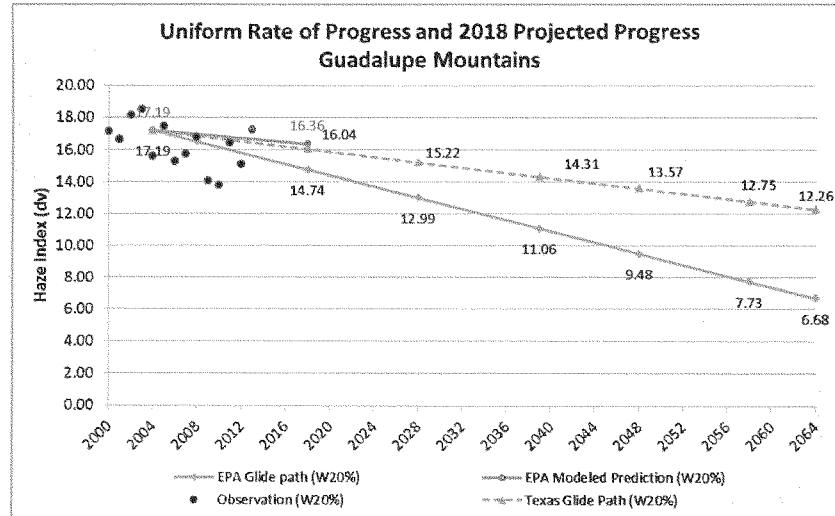


Figure 3 - Observed and predicted W20% haze index values for Guadalupe Mountains.

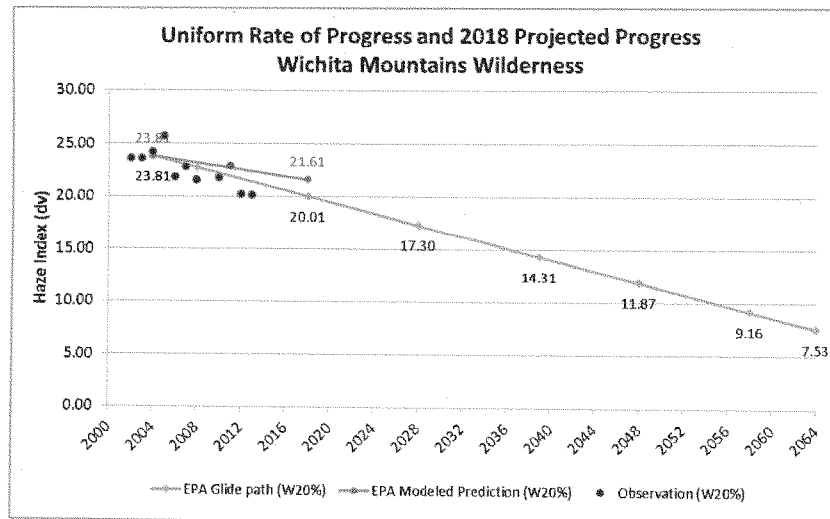


Figure 4 - Observed and predicted W20% haze index values for Wichita Mountains Wilderness area.

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Natural Background Calculation Methods

When including the alternate uniform rate of progress slope calculation made by TCEQ in its SIP submittal, a calculation that uses a refined methodology to estimate natural visibility conditions, we also find these observations are even more favorable at Big Bend and Guadalupe Mountains than when compared to EPA's calculated uniform rate of progress line. The TCEQ constructed their URP by plotting a straight graphical line from the baseline level of visibility impairment to the level of visibility conditions representing no anthropogenic impairment in 2064 for both Big Bend and the Guadalupe Mountains. No alternate calculation was made by Texas for the Wichita Mountains Wilderness Class I area. This revised calculation is represented by the green dotted line in Figures 2 and 3 above and represents a natural background visibility estimate that assumes 100% of the amount of natural fine soil and coarse mass in 2064 is natural.

Title 40 CFR §51.308(d)(2)(iii) states that the ultimate responsibility for calculating natural conditions lies with the state. Even though the EPA "Guidance for Estimating Natural Visibility Conditions Under the Regional Haze Program" provides "default" estimates of natural visibility, it, too, emphasizes the state's right to derive "refined" estimates.

If we were to define "natural conditions" as EPA does in its guidance, we would state that this level is the result of visibility conditions that would be experienced in the absence of human-caused impairment. Using this definition, it is reasonable to agree with TCEQ's 2064 natural background visibility estimate that 100% of the amount of natural fine soil and coarse mass are natural. EPA's argument includes the fact that their review of the *baseline* visibility estimate, an average of recent observational conditions, and a level that TCEQ has agreed is the same as EPA's calculation and that EPA approved in their review of the SIP, does not take into account that 100% of the coarse mass and fine soil measured are attributable to natural sources. In reality, it is not the current year average baseline value that EPA should be concerned. This baseline value is the starting point for the uniform rate of progress line that initiates with current condition calculations for the W20% days and ends at 2064 natural conditions; a level absent of manmade influence.

In calculating the uniform rate of progress slope, TCEQ's assumption of 100% natural contribution to coarse mass and fine soil in 2064 meets the true definition of natural background visibility, the end point of URP slope. EPA notes that anthropogenic sources of coarse mass and fine soil in the recent baseline period could have included emissions associated with vehicle perturbed paved and unpaved road dust, agricultural activity, and construction activity. However, EPA does not make the same statement for the 2064 natural background calculation, a visibility calculation purposefully absent the influence of these manmade interactions with natural emissions, as TCEQ notes in its refined calculation.

In its disapproval of this area of the SIP, EPA states that because "we find that the TCEQ has not adequately demonstrated that all coarse mass and fine soil measured in the baseline period can be attributed to 100% natural sources", TCEQ does not meet the calculation of the natural visibility conditions for the Big Bend and Guadalupe Mountain Class I areas under §51.308(d)(2)(iii). However, EPA's judgment on this point only refers to the baseline, or current, levels of the URP, not the natural background endpoint, the value that TCEQ uses its right to calculate using an alternate method.

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Since EPA's own definition of natural visibility conditions supports TCEQ's usage of 100% natural source composition of coarse mass and fine soil, it can be concluded that the TCEQ approach to estimating natural visibility conditions is reasonable. Additionally, EPA has not adequately demonstrated that the 80% natural source composition default value is more appropriate than TCEQ's 100% value at these specific Class I areas.

Wildfire and Dust Impact on Visibility

When reviewing the observed visibility at Big Bend National Park (Figure 5) and plotting the W20% days, it is noted that many of these days have statistically high standard deviations compared to other recent years of observations. A closer review of the dates of these uncharacteristic observations tie many of the W20% days to wildfire impact events during the 2011 calendar year.

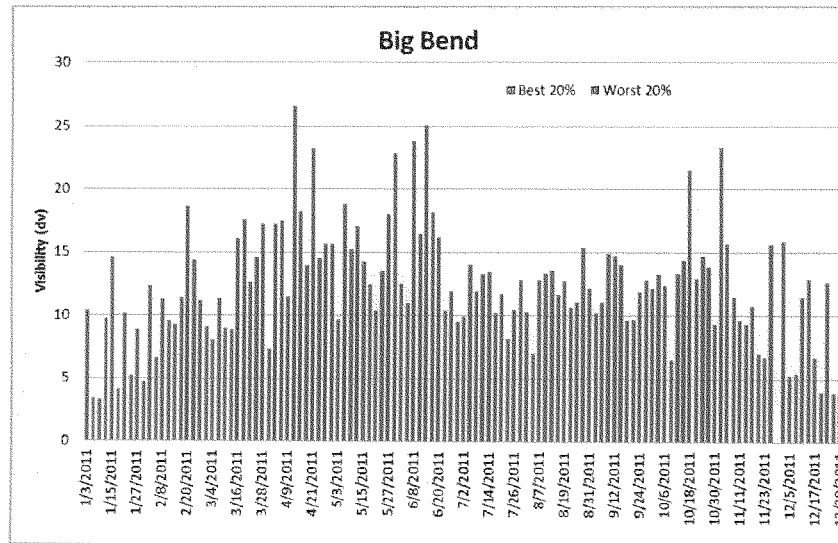


Figure 5 – B20% and W20% days for Big Bend National Park in 2011.

Fires across the southern U.S. led 2011 to having the third most active wildfire season since 2000 with respect to acres burned and sixth least active in terms of number of fires, indicating an historically greater number of acres burned per fire than the twelve year average. Texas had the most acres burned of any state during the year, with over 3.7 million acres burned across the state during 2011, 43 percent of the national total and a State record in acres burned since the Texas Forest Service started keeping records in 1985. During the three month period of Mar-May in 2011, 20,100 fires burned over 3.2 million acres across the U.S., mostly across Texas, Arizona, and New Mexico. The acres burned were

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record high for the 3-month period, surpassing the spring of 2008 when 1.5 million acres burned nationwide

To demonstrate the impact that these events have on the observed conditions at each monitor, Table 2 presents the individual days selected at Big Bend in 2011 used to represent the W20% for the year. Highlighted dates and visibility observations indicate those days found to be impacted by wildfire events using satellite imagery and interpretation. It should be noted that this type of review is also applicable to the Guadalupe Mountains and Wichita Mountains Wilderness Class I areas.

Table 2 – W20% days at Big Bend National Park in 2011. Highlighted values indicate days with exceptional event influence.

Date	Visibility (dv)	Date	Visibility (dv)
20-Feb-11	18.63	12-May-11	17.05
16-Mar-11	16.05	27-May-11	18.02
19-Mar-11	17.60	30-May-11	22.84
28-Mar-11	17.25	8-Jun-11	23.86
3-Apr-11	17.25	11-Jun-11	16.45
6-Apr-11	17.47	14-Jun-11	25.07
12-Apr-11	26.59	17-Jun-11	18.18
15-Apr-11	18.21	20-Jun-11	16.21
21-Apr-11	23.26	18-Oct-11	21.48
27-Apr-11	15.66	2-Nov-11	23.31
30-Apr-11	15.66	5-Nov-11	15.66
6-May-11	18.81	2-Dec-11	15.85

Satellite Smoke Text Product from the Satellite Services Division of the NOAA National Environmental Satellite, Data, and Information Service (NESDIS) were reviewed for each of the W20% days at Big Bend National Park with fire impacted periods described in Table 3. Further satellite imagery of the domain was also collected from the NASA earth observatory website, corroborating the textual descriptions of most of the smoke events. These images are shown in Figures 6, 7, and 8.

Table 3 – Satellite Smoke Text Product for Big Bend National Park³.

Date	Visibility	Smoke Description
4/3/2011	17.25 dv	The fires that have been burning for the past few weeks through northern Coahuila, Mexico have a rather large area of moderate and heavy smoke moving toward the northeast and reaching into parts of southern/southeast Texas near Crystal City this evening. (Apr 3)
4/6/2011	17.47 dv	Several large fires continue to burn over northern Coahuila this evening just south of the Big Bend Region of Texas. These fires have combined to produce a large moderate to extremely dense smoke plume that was

³ http://www.ssd.noaa.gov/PS/FIRE/2011_archive_smoke.html

Date	Visibility	Smoke Description
		drifting east into portions of South Texas. (Apr 6)
4/12/2011	26.59 dv	Fires over western and northwestern Mexico were emitting plumes of smoke during the day which moved mainly to the northeast. Some of the thin density leading edge of this smoke had blown all the way into extreme southeastern Texas just prior to sunset. Farther to the northeast, huge fires continued to burn in northern Mexico just south of the Texas border producing dense smoke which moved rapidly to the northeast crossing the border just north of Del Rio and continuing to the northeast reaching northeastern Texas just east of Dallas-Ft. Worth by late in the day. (Apr 9)
4/15/2011	18.11 dv	High winds across parts of western Texas has started several large wildfires producing moderately dense to dense smoke moving east into central Texas. The large wildfires across northern Mexico are emitting very heavy smoke moving east into southern Texas and combining with remnant smoke from fires burning across other parts of Mexico and Central America which that smoke is moving north. (Apr 15)
4/21/2011	23.35 dv	Smoke from the fire in Hardin and Tyler counties of southeastern Texas reached as far north as southeastern Oklahoma and southwestern Arkansas. Other significant smoke plumes were associated with a large fire in east central New Mexico and the ongoing huge fires in northern Mexico, just south of the Texas border. (Apr 18)
5/6/2011	16.81 dv	Remnant smoke is seen in morning satellite imagery tracking west southeast across southern portions of New Mexico towards western Texas. Smoke likely originated from large wildfire that has been burning for several days across portions of northern Grand county in southwestern New Mexico. (May 6)
5/27/2011	18.02 dv	An large mass of primarily smoke continues to cover much of northeast Mexico and the western Gulf of Mexico, extending northward over nearly all but far west Texas and into eastern and central Oklahoma, southeast Kansas, southern Missouri, Arkansas and Louisiana and across the northern tier of Alabama and Mississippi and much of Tennessee. Embedded moderately dense to even dense smoke is present over the western Gulf of Mexico and portions of eastern and central Texas. This huge area of smoke was mainly from seasonal fires over northern Mexico, the Yucatan and Central America. (May 24)
5/30/2011	22.64 dv	A large area of light smoke can be seen in this morning's imagery from northern Mexico through Texas and into the central Plains stretching as far east as Illinois. This is from the continued fires through Mexico and Central America as well as more recent fires through the southwest. There is also a possibility that blowing dust from yesterday evening could be mixing in with smoke as well today as surface winds continue to be strong out of the south/southwest. (May 30)

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Date	Visibility	Smoke Description
6/9/2011	23.88 dv	Smoke remains over much of the east two thirds of the contiguous U.S. this morning with most of the remnant smoke originating from the two large wildfires in eastern Arizona. Thin smoke was seen streaming northeast from Mexico into New Mexico/West Texas. (Irr-3)
6/14/2011	25.07 dv	Several large wildfires (e.g. Willow, Horseshoe 2) continue to emit moderately dense to dense smoke that extends northeast across New Mexico and into north Texas/western Oklahoma, Colorado, and Kansas. (Irr-14)

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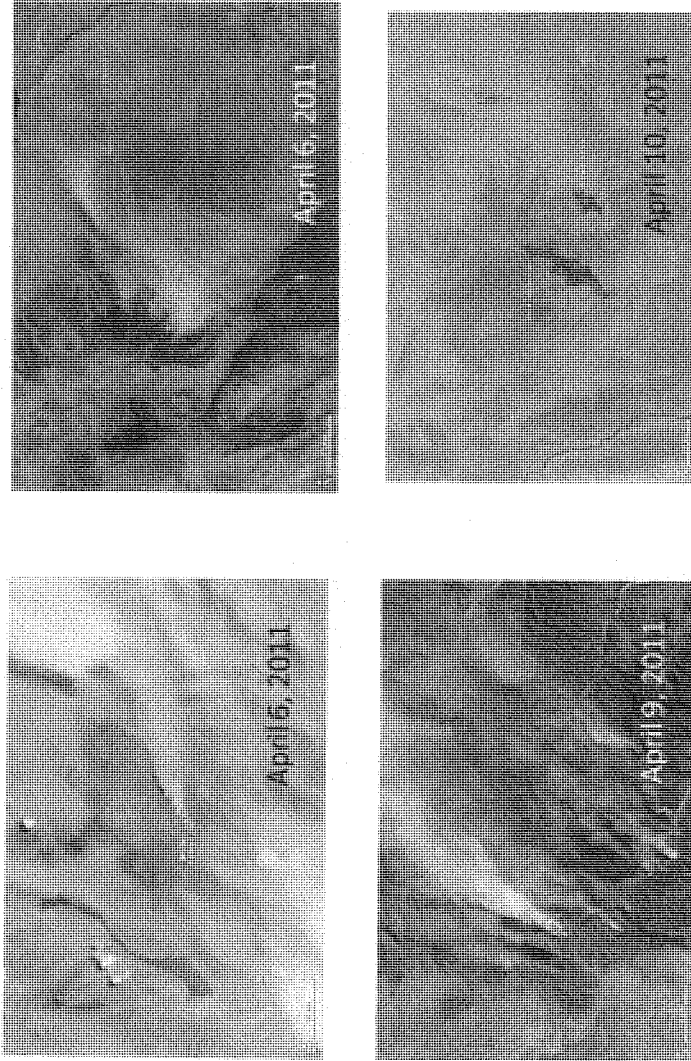


Figure 6 ~ Regional satellite imagery for Big Bend National Park; April 6, 9, and 10, 2011.

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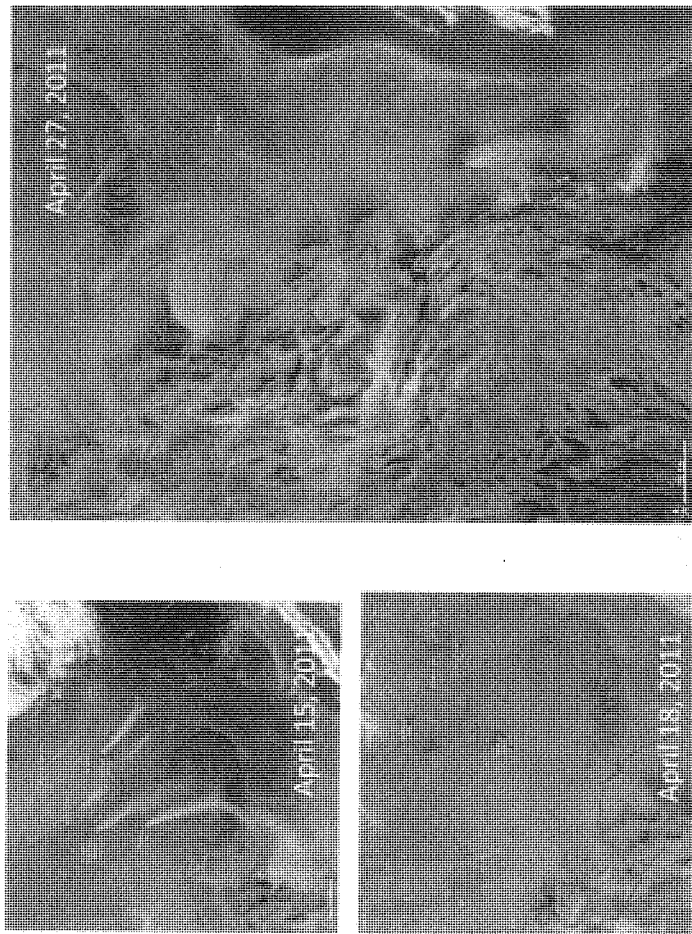


Figure 7 - Regional satellite imagery for Big Bend National Park; April 15, 18, and 27, 2011.

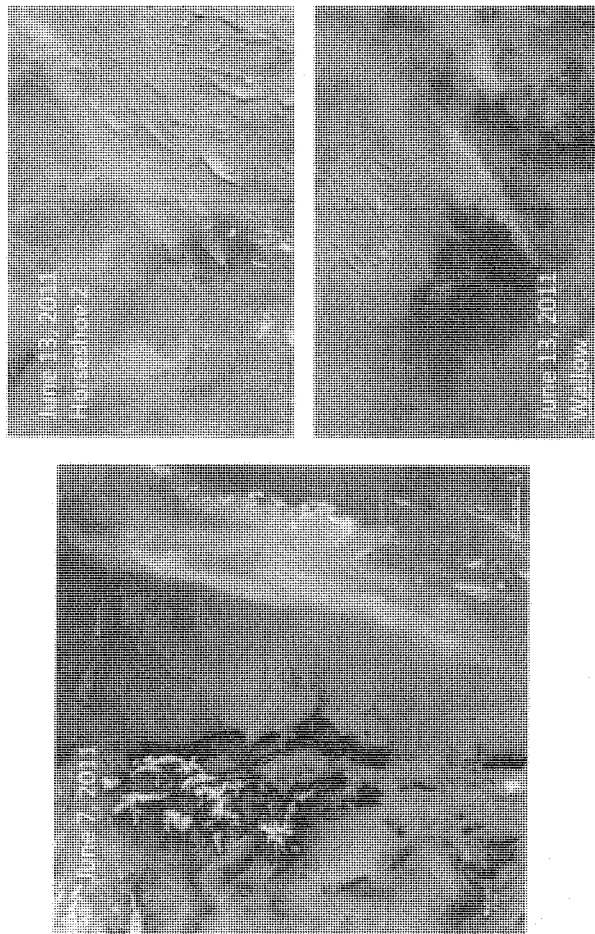


Figure 8 - Regional satellite imagery for Big Bend National Park; June 7 and 13, 2011.

When these wildfire impact days are removed from the W20% calculation, it can be seen in Figure 9 that the observational trend line would fall well below the EPA uniform rate of progress line.

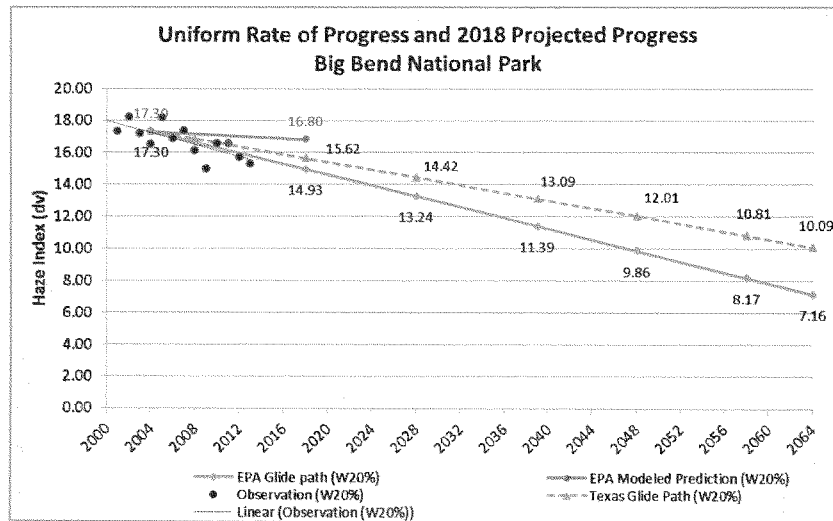


Figure 9 – Wildfire impact adjusted W20% haze index values for Big Bend National Park.

Similarly, in 2013 as documented in other years, dust event impacts have been tied to daily observations Class I areas in Texas⁴. When removing dust impacted days (Table 4) from the W20% calculations, there are visibility trend improvement results comparable to years when wildfire impacts are removed, as shown in Figures 9 and 12.

Satellite Smoke Text Product were again reviewed for each of the W20% days at Guadalupe Mountain for dust impacted periods identified in Table 4. Further satellite imagery of the domain was also collected from the NASA earth observatory website, corroborating the textual descriptions of most of the dust events. An example image is presented in Figure 11.

When these wildfire and dust event impacted days are removed from the W20% calculation and new W20% calculations are incorporated, the observational trend line falls below both the EPA and Texas calculated rate of progress lines for each of the Class I areas. The significantly active wildfire year in 2011 and dust events in 2013 could justify removal of daily readings most impacted by smoke and dust at each of the Class I areas and as demonstrated would show an even greater attainment of the uniform rate of progress line.

⁴ https://www.tceq.texas.gov/assets/public/implementation/air/sip/bart/haze_sip-dust_storms.pdf

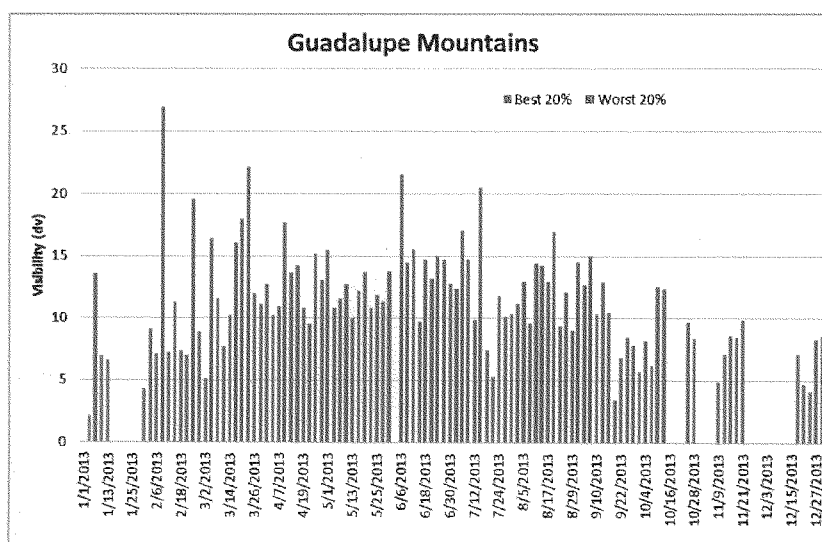


Figure 10 – B20% and W20% days for Guadalupe Mountains in 2013.

Table 4 – W20% days at Guadalupe Mountains in 2013. Highlighted values indicate days with exceptional event influence.

Date	Visibility (dv)	Date	Visibility (dv)
9-Feb-13	26.93	12-Jun-13	15.53
24-Feb-13	19.55	18-Jun-13	14.75
5-Mar-13	16.40	24-Jun-13	15.04
17-Mar-13	16.07	27-Jun-13	14.74
20-Mar-13	18.02	6-Jul-13	17.05
23-Mar-13	22.13	9-Jul-13	14.70
10-Apr-13	17.73	15-Jul-13	20.52
25-Apr-13	15.18	20-Aug-13	16.93
1-May-13	15.48	1-Sep-13	14.52
6-Jun-13	21.59	7-Sep-13	14.99
9-Jun-13	14.48		

Table 5 – Satellite Smoke Text Product for Guadalupe Mountains⁵.

Date	Time (hr)	Smoke Product Report
2/18/2013	25:53 dw	An area of dust can be seen blowing to the northeast from the White Sands in New Mexico. This area of dust extends about 60 miles through Ureah county and into central Guadalupe county. (Feb 5)
2/24/2013	19:55 dw	Narrow plumes of blowing dust were observed in satellite imagery this morning originating from sources in northern Chihuahua south of New Mexico and drifting to the east northeast toward the Rio Grande. (Feb 24)
3/5/2013	18:40 dw	An extensive blowing dust event was underway across far northern Mexico, southern New Mexico, and west Texas as strong winds crossed the region. (Mar 5)
3/23/2013	22:18 dw	Several point sources of blowing dust were also noted over northern Chihuahua Mexico. This area of dust moved to the east into far West Texas. (Mar 23)
4/10/2013	17:73 dw	In the first visible images today, significant areas of blowing dust can be seen in the Southwest US into Mexico. A detached area of blowing dust/sand is located from the Baja Peninsula to Sonora and is moving to the south. A larger, more dense area of blowing dust/sand stretches from northern Chihuahua, where small pockets are still generating more blowing dust/sand, north through eastern New Mexico up to the Colorado border. There also appears to be a small pocket of blowing dust/sand in northern Texas / Oklahoma panhandle area. (Apr 10)
6/20/2013	14:48 dw	An area of thin smoke mixed with blowing dust was seen over north central to southeast New Mexico, west Texas, and northeast Mexico. The smoke has mostly come from the Thompson Ridge fire in northern New Mexico. Blowing dust could be seen just west and southeast of El Paso, TX. (Jun 9)

⁵ http://www.ssd.noaa.gov/PS/FIRE/2013_archive_smoke.html

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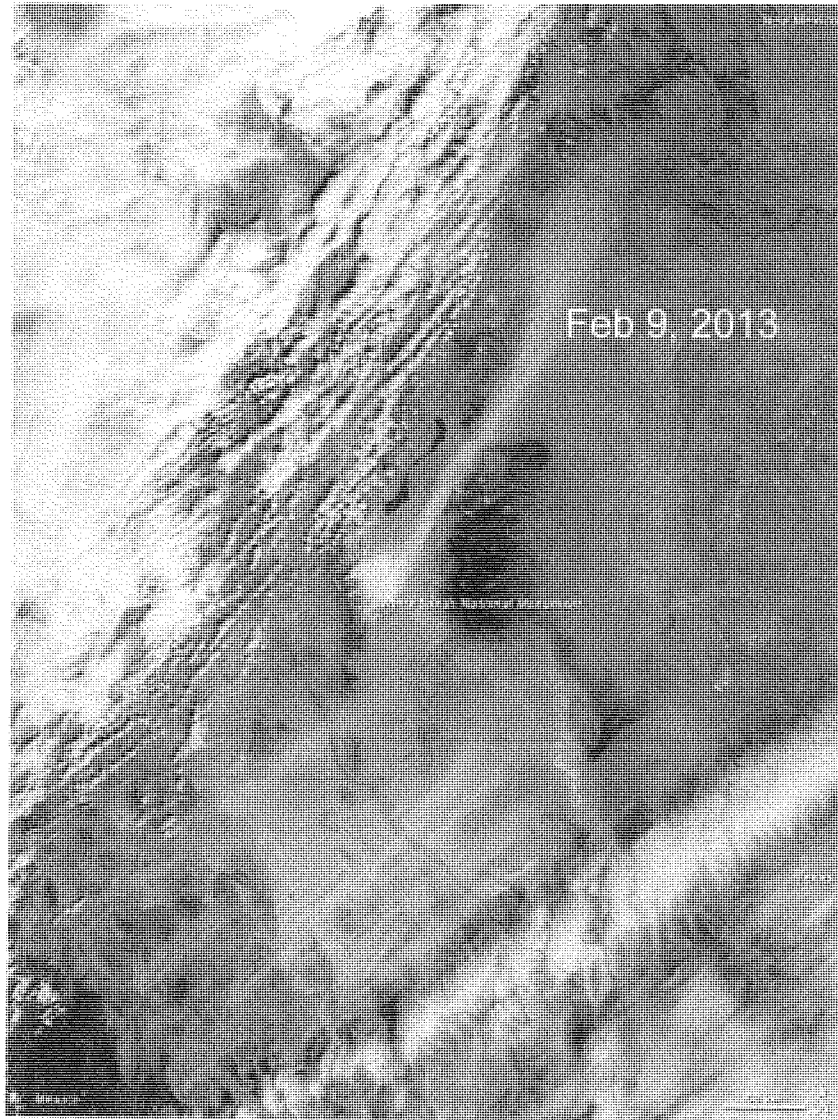


Figure 11 - Regional satellite imagery for Guadalupe Mountains; February 9, 2013.

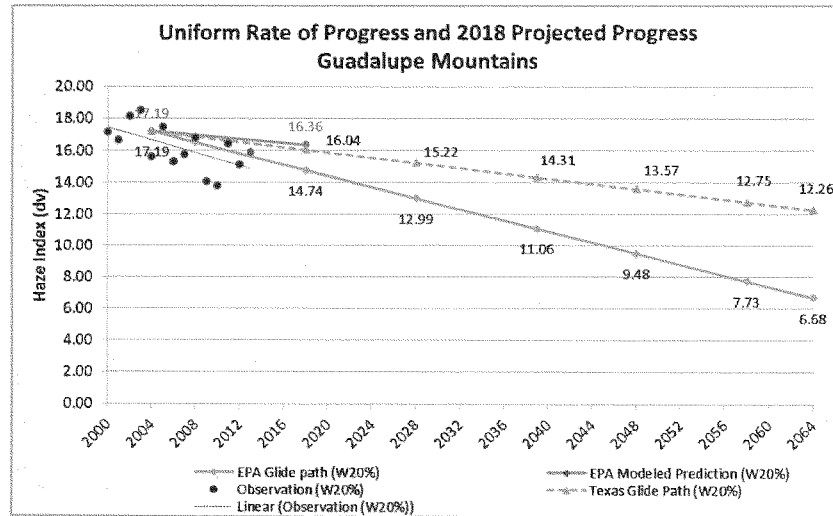


Figure 12 – Dust impact adjusted W20% haze index values for Guadalupe Mountains.

Emission Reduction Impacts on Improved Visibility

I concur with EPA's findings that this observed improvement from the baseline conditions is the result of reduction in the impacts from SO₂ emissions and a reduction in the impacts from coarse material but disagree that it is related to meteorological conditions more than emission changes.

Observing recent trends in annual SO₂ emissions from Texas (Figure 13)⁶, it can be seen that since 1999 and through 2011, a reduction of 50% in SO₂ emission has occurred across all anthropogenic categories State-wide. A significant portion of this reduction is attributed to electric utility coal fuel combustion (38%), as well as from industrial fuel combustion and processes (70%). And according to TCEQ's point source emission inventory, these values continue to decrease beyond 2011 levels for all point sources reporting to the State⁷.

Additionally, comparing the past six years of annual temperature and precipitation ranks as reported by NOAA⁸, it is noted that except for calendar years 2011 and 2012, temperatures and precipitation (Figures 14 and 15) for the past few years have been considered "normal" or "near normal" by NOAA historical standard. Paired with the reductions achieved in SO₂ from various sources in the impact domain, this appears to indicate that continued decreasing haze indexes measured at each of the three

⁶ http://www.midwestozonegroup.com/files/AQTrendsSummary_Texas_3.ppt

⁷ <https://www.tceq.texas.gov/airquality/point-source-ei/psei.html>

⁸ <http://www.ncdc.noaa.gov/temp-and-precip/us-maps/>

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Class I area monitors are associated with emissions reduction more than from the impacts of meteorology.

In contrast, the remainder of the recent historical record of temperature and precipitation data is relatively consistent from year to year, leading to the conclusion that emission reductions of SO₂ were the primary driver of the visibility improvements, not an impact or change in meteorological conditions over this period.

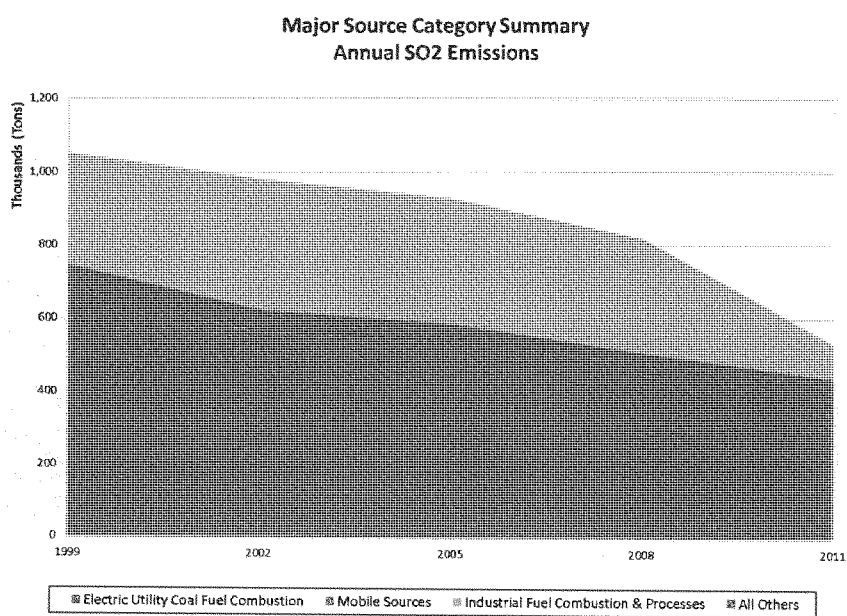
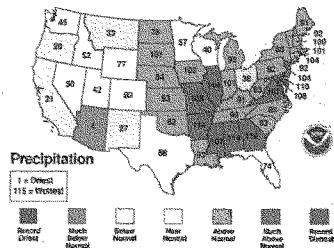


Figure 13 - Annual SO₂ Emission Trends - Texas.

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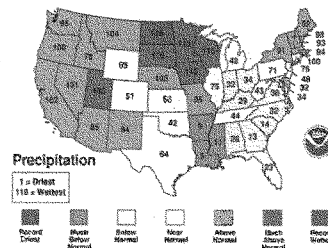
January-December 2009 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



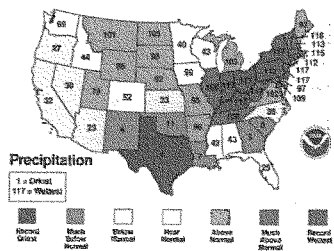
January-December 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



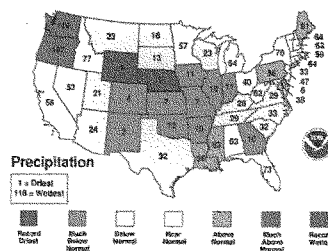
January-December 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



January-December 2012 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



January-December 2013 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA

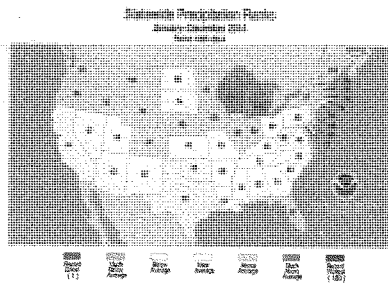
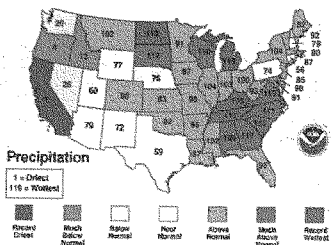
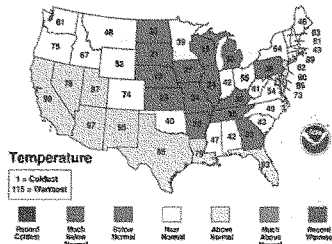


Figure 14 - NOAA historical ranks of annual State precipitation.

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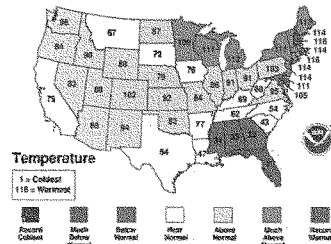
January-December 2009 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



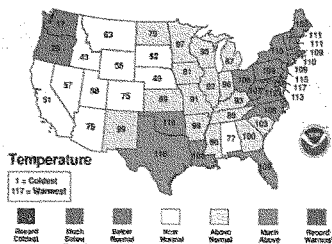
January-December 2010 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



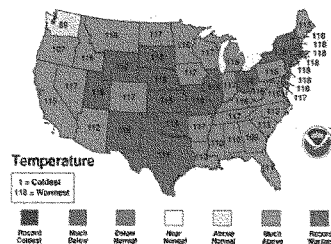
January-December 2011 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



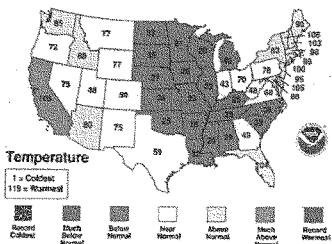
January-December 2012 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



January-December 2013 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Statewide Average Temperature Ranks

January-December 2011

Temperatures

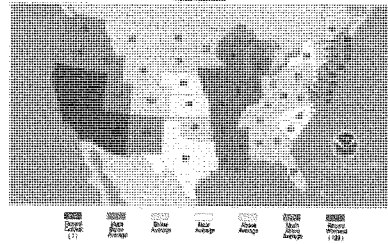


Figure 15 - NOAA historical ranks of annual State temperature.

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Emission and Modeling Inventories Used to Support Disapproval of Texas's SIP Submittal

To support EPA's disapproval of portions of Texas' SIP submittal, the Agency relied on 2002 base year modeling projected to 2018, originally conducted for CENRAP in 2007, augmented with limited source updates as documented in the SIP review process⁹. It is my opinion that EPA's modeling, using this dated modeling platform, generated regional haze results and modeled source impacts that were erroneously high.

EPA's Modeling Inventories and Projections Are Objectively Inaccurate and Artificially Inflate the Modeled Impacts of Texas Sources on Regional Haze Levels

Current EPA emission inventory data¹⁰ shows reductions in emissions in most states beyond what was projected in the 2018 CENRAP modeling, including large reductions in emissions from Texas and the southern States. Emissions from both EGU and non-EGU Texas point sources are lower than have been projected in the CENRAP modeling and should be considered in concert with emission reductions recently reported by EPA from all other contributing sources in the modeling domain.

Comparing emissions in the Texas Regional Haze FIP technical support document ("TSD") to EPA's most recently released modeling platform and emissions projections, we can see in Figure 16 that total SO₂ emissions, from all anthropogenic sources, are significantly higher in magnitude in both the FIP base year (2002) and projection year (2018), relative to base year (2011) and projections (2018) from the new platform.

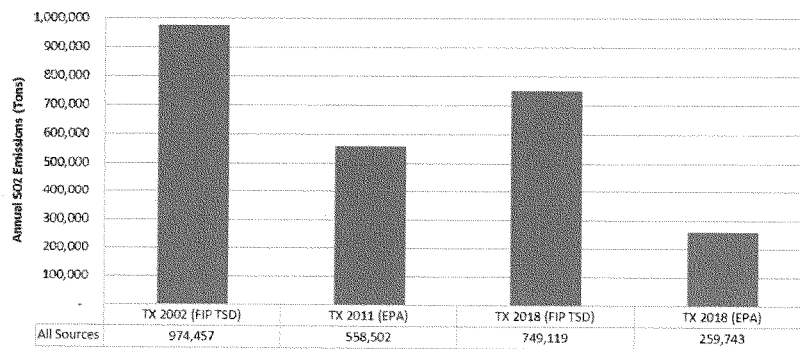


Figure 16 - SO₂ annual emissions comparison, all sources, Texas. EPA FIP TSD emissions (red) compared to recent EPA modeling platform (blue).

⁹ EPA-R06-OAR-2014-0754-0010

¹⁰ ftp://ftp.epa.gov/EmissionInventory/2011v6/ozone_naaqs/reports/2011v6.1_2018_2025_base_EmisMod_TSD_nov2014_v6.pdf

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Much of this difference is attributed to the 2007 vintage of the EPA's FIP modeling inventories and demonstrates the improved data, methods, and models used to prepare current, state-of-knowledge emission inventories in the past year. Simply stated, the overall influence of SO₂ emissions from current EPA emissions and projections is significantly lower in 2011 and 2018 than those emissions and projections EPA used to simulate visibility in the Texas FIP modeling.

As an example, both EPA and Texas have cited the use of the Integrated Planning Model (IPM), a multiregional, dynamic, deterministic linear programming model of the U.S. electric power sector. Version 5.13 of this model reflects state rules, consent decrees, and announced shutdowns through August, 2013. IPM 5.13 was significantly updated from IPM 2.19 that EPA relied on in its review of TCEQ's SIP and represents electricity demand projections from the Annual Energy Outlook 2013.

In Table 8 of EPA's TSD used to support their FIP, the Agency noted annual emission estimates of SO₂ from the EGU sector. We have added to this table EPA's most current estimate of Texas' SO₂ emissions from EGUs as projected to 2018 with IPM 5.13 (Table 6).

Table 6 - Comparison of Texas 2002 Baseline SO₂ emissions, 2015 CAIR EGUs Budget and 2018 IPM Predicted SO₂ Emissions.

SO ₂ Emissions	Texas SO ₂ Emissions (tpy)
CENRAP 2002 base case	550,000
EPA's CAIR budget for Texas EGUs for 2015	225,000
IPM 2.19 projection CENRAP modeled for 2018	350,000
IPM 5.13 projection EPA modeled for 2018	144,520

Reviewing these latest IPM projections of EGU point source SO₂ emissions, estimates that represent EPA's latest view of the implementation of the Clean Air Interstate Rule and the Mercury and Air Toxics Standards, and comparing them to EPA's FIP TSD emission estimates, we note that EPA is now projecting annual SO₂ emissions from EGUs to be significantly lower than they did before. In fact, SO₂ from the EGU sector is projected to be 205,000 tons lower, or an approximate 60% lower value than what EPA cites for these sources in the FIP TSD.

Since the EPA source apportionment modeling uses the dated, higher EGU emission estimates and projection year inventories, we have a high level of confidence that EPA is overestimating the SO₂ emissions predicted regionally and therefore underestimating the improvements in visibility at the identified Class I areas.

When the combination of current EPA predicted EGU and non-EGU point and other nonpoint emission reductions are taken into account, both within Texas and in the surrounding domain, it is reasonable to expect that modeled visibility improvement will be achieved, consistent with the observational record.

Mexican Emissions Will Impact Results More Than Predicted

The TCEQ noted that the CENRAP Particulate Matter Source Apportionment Technology ("PSAT") analysis indicates that 52% of the impairment at Big Bend and 25% of the impairment at Guadalupe Mountains is from Mexico and further south (Figures 17 and 18, respectively). EPA agreed with the TCEQ and based on the CENRAP PSAT modeling, that emissions and transport from Mexico and other international sources will limit the rate of progress achievable on the 20% worst days and that efforts to meet the goal of natural visibility by 2064 would require further emissions reductions not only within Texas, but also large emission reductions from international sources.

In fact, Table 7 provides summaries of more recent modeling studies utilized by EPA to estimate the emissions from Mexico and demonstrates Mexican point source emissions of SO₂ have shown an increase since 2008 and are projected to increase even more through 2030¹¹. This increase has created a higher magnitude of transported visibility impairing emissions to the Class I areas as compared to the CENRAP modeling estimates.

Additionally, with demonstrated reductions in SO₂ from Texas emission sources, this international component most likely will increase the Mexican percentage of contribution to visibility impairment at both Big Bend and Guadalupe Mountains and should be considered when establishing rate-of-progress determinations.

¹¹ <http://www.epa.gov/ttnchie1/conference/ei18/session2/wolf.pdf>

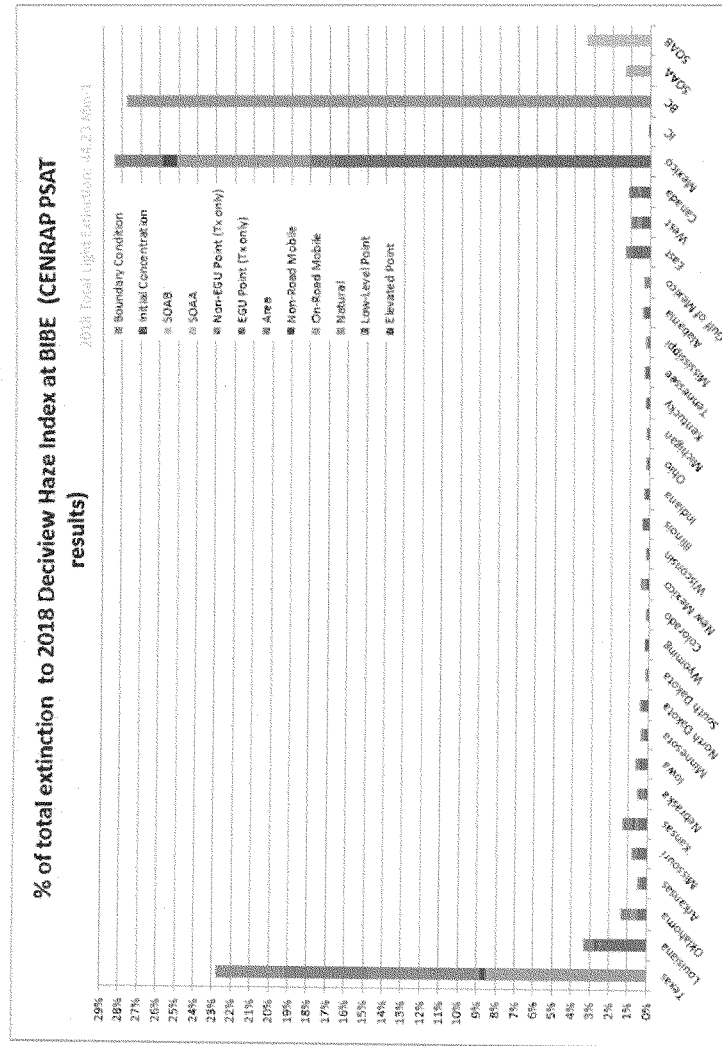
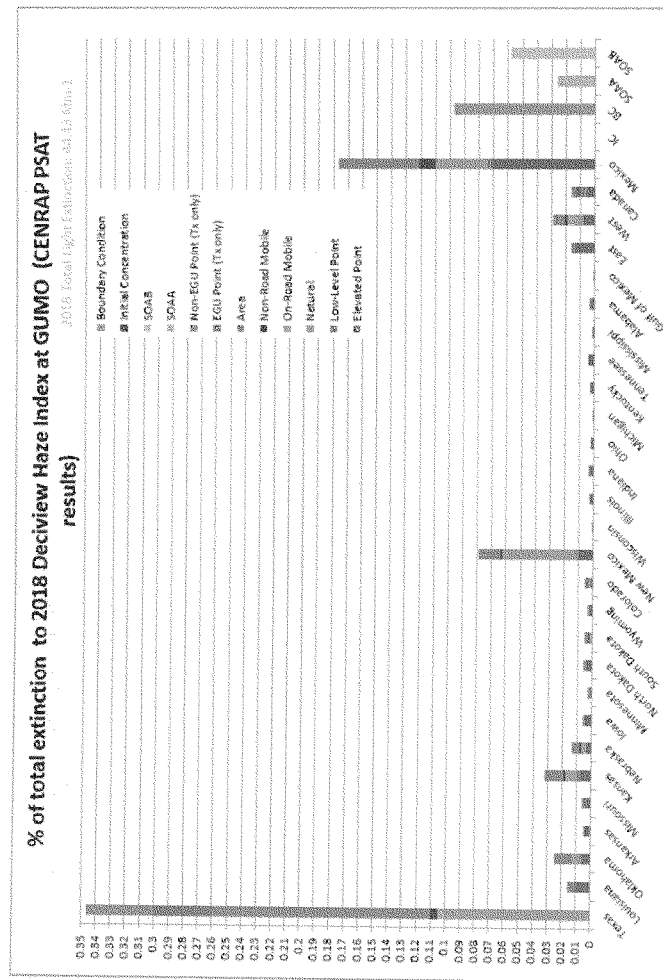


Figure 17 - 2018 projected percent contribution from all sources at Big Bend. Source: Figure 6, EPA-R06-OAR-2014-0754-0005.



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	NO _x	SO ₂	VOC	CO	PM ₁₀	PM _{2.5}	NH ₃
1999							
Point	448,826	2,633,799	247,878	167,648	297,264	198,917	
Area	276,321	194,642	1,743,587	2,500,852	439,253	320,369	1,130,400
On-Road	435,665	24,453	573,042	4,671,842	20,567	18,845	7,609
Nonroad	263,768	3,486	35,169	153,604	37,240	36,123	
Total	1,424,580	2,856,380	2,599,676	7,493,946	794,324	574,254	1,138,009
2008							
Point	606,053	2,575,537	328,096	237,926	359,919	239,274	
Area	363,963	119,763	2,106,842	3,068,145	483,735	355,488	724,092
On-Road	370,177	27,765	399,936	2,872,420	31,890	29,551	11,931
Nonroad	281,006	3,709	38,290	165,890	40,447	39,234	
Total	1,621,199	2,726,774	2,873,164	6,344,381	915,991	663,547	736,023
2012							
Point	686,509	2,615,816	348,004	262,449	388,825	256,861	
Area	415,907	60,094	2,202,932	2,939,976	443,800	317,645	727,417
On-Road	336,519	12,490	340,519	2,065,988	34,019	31,258	14,533
Nonroad	296,402	3,911	40,463	175,197	42,734	41,452	
Total	1,735,337	2,692,311	2,931,918	5,443,610	909,378	647,216	741,950
2030							
Point	1,239,873	3,359,643	455,901	436,116	638,533	420,929	
Area	854,999	23,223	3,170,187	4,167,536	412,043	286,518	738,330
On-Road	117,883	5,366	317,164	2,731,909	71,402	64,816	36,529
Nonroad	437,465	5,777	59,058	256,756	62,449	60,576	
Total	2,650,220	3,394,009	4,002,310	7,592,317	1,184,427	832,839	774,859

Table 7- Baseline Mexico emissions by source type (Mg/yr).

Based on these most current emission estimates and projects in use by EPA, the impact of Mexican source emission projections should be considered, and with greater weight, during additional regional haze modeling to better attribute non-domestic visibility impairment at the Big Bend and Guadalupe Mountains Class I areas. Should these current Mexican emissions and their increased regionally significant effect on sulfate concentrations have been used by EPA in their modeling, the influence of domestically generated emissions and relative impact of incremental controls within the State of Texas could be substantially less than what EPA predicts.

EPA's Failure to Follow Its Own Modeling Guidance

EPA's current draft modeling guidance document¹², as well as previous final versions of this guidance and current BART modeling protocols are designed to inform air quality planning by providing documentation that adequately supports and describes the procedures used in an analysis. Additionally, it is recommended by the Agency that a modeling protocol be prepared (to facilitate Regional Office review and approval of a modeling analysis) before the modeling is conducted.

These protocol documents are designed to detail and formalize the procedures for conducting any modeling study and effectively communicating to the Agency and impacted stakeholders, what the blueprint is for the study at hand. An appropriate protocol document would lead to extensive

¹² http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf

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participation by stakeholders in developing the demonstration and reduce the possibility, in advance of any analysis, of the modeling entity to have used incorrect, invalid, or outdated information.

EPA Did Not Publish a Modeling Protocol

The EPA guidance for BART modeling¹³, CENRAP's BART modeling guidance¹⁴ and the EPA guidance for the use of photochemical grid model for regional haze¹⁵ all require a modeling protocol be prepared and submitted for public comment. The modeling protocol specifies how the modeling will be conducted, how the modeling results will be analyzed and how the modeling results will be used to inform decisions before any modeling actually occurs.

EPA states in the 2007 "Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5 and Regional Haze":

"Developing and implementing a modeling/analysis protocol is a very important part of an acceptable modeled attainment demonstration. The protocol should detail and formalize the procedures for conducting all phases of the modeling study, such as describing the background and objectives for the study, creating a schedule and organizational structure for the study, developing the input data, conducting model performance evaluations, interpreting modeling results, describing procedures for using the model to demonstrate whether proposed strategies are sufficient to attain the NAAQS and/or regional haze goals, and producing documentation to be submitted for EPA Regional Office review and approval."

Furthermore, EPA states in the December 2014 "Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze"¹⁶:

"As with any technical support document designed to inform air quality planning, an attainment demonstration should be supported by documentation that sufficiently describes the procedures used in the analysis. In order to facilitate the process of EPA Regional Office review and approval, we recommend the preparation of two separate supporting documents: one before the modeling analyses are initiated (modeling protocol) and one after the analyses have been completed (attainment demonstration package)."

The EPA BART modeling guidance states:

"For regional haze applications, regional scale modeling typically involves use of a photochemical grid model that is capable of simulating aerosol chemistry, transport, and deposition of airborne pollutants, including particulate matter and ozone. Regional scale air quality models are generally applied for geographic scales ranging from a multistate to the

¹³ 70 CFR Part 128 pp 39125

¹⁴ Alpine Geophysics, 2005. CENRAP BART Modeling Guidelines. Prepared by Alpine Geophysics, LLC, Prepared for Central Region Air Planning Assoc. 15 December 2005.

¹⁵ EPA, 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze. EPA-454/B-07-002.

¹⁶ http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf

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continental scale. Because of the design and intended applications of grid models, they may not be appropriate for BART assessments, so States should consult with the appropriate EPA Regional Office prior to carrying out any such modeling.”

For this modeling the EPA chose to use regional scale photochemical modeling. Although there is no technical objection to the use of the regional scale photochemical modeling, the CENRAP BART modeling guidance states:

“EPA’s BART guidance clearly indicates the need for a detailed modeling protocol to support any application of alternative models for BART analyses. An example of the content of such a one atmosphere modeling protocol would be the CMAQ/CAMx modeling protocols developed for CENRAP (Morris et al., 2004c) and VISTAS (Morris et al, 2004a). In addition, certain components of the screening and source-specific protocols developed with CALPUFF (Tables 6-1 and 7-2) would be appropriate. The alternative modeling protocol should be submitted to the state, regional EPA office and FLM for review and negotiation. Note that EPA’s role in the development of the protocol is only advisory as the “states better understand the BART-eligible” source configurations” and factors affecting their particular Class I areas (70 FR Part 128 pp 39126).”

While a modeling protocol was prepared in 2004 to support the development of the 2002 to 2018 modeling platform¹⁷, this project has made significant alterations to the emissions inventory used in the development of this modeling platform and the state of science in photochemical model has advanced in the decade since this modeling platform¹⁸. Furthermore, this existing protocol does not cover how the modeling results will be used to assess if additional controls are required on specific units.

Since this modeling was conducted by EPA, EPA’s modeling protocol should have been discussed with other outside groups, especially impacted stakeholders in the process before moving forward with the analysis. The most transparent way to accomplish this would have been to prepare and share a modeling protocol in order to advise the public and solicit input on the actions that were to be taken with the modeling and analysis. In this case, consistent with EPA’s own guidance on the matter, an updated modeling protocol should have been prepared and presented for public and other government agency comment.

¹⁷ http://pah.cert.ucr.edu/aqm/cenrap/docs/CENRAP_Draft2.0_Modeling_Protocol_120804.pdf

¹⁸ EPA-R06-OAR-2014-0754-0010

**Oklahoma Department of Environmental Quality
Air Quality Division
707 North Robinson
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(405) 702-4100**

Submitted via Email to: *R6_TXOKRegionalHaze@epa.gov* on April 20, 2015.

Re: ODEQ comments on EPA's proposed (Docket ID No. EPA-R06-OAR-2014-0754)

I. Introduction

These comments are submitted in response to the U.S. Environmental Protection Agency's ("EPA") proposed: *Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan To Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility* ("Proposed Rule"), published in the Federal Register on December 16, 2014 (79 Fed. Reg. 74818). After consideration and evaluation of the Proposed Rule, ODEQ submits the comments contained herein.

II. EPA's Proposal

In the Proposed Rule, EPA is proposing to implement SO₂ emission limits on fifteen Texas sources in order to achieve visibility improvements at three Class I areas, including the Wichita Mountains National Wildlife Refuge located in Oklahoma. Additionally, EPA proposes to set new reasonable progress goals for Oklahoma regarding the Wichita Mountains area. Oklahoma understands and expects that no emission reductions or other additional steps will be required of sources in Oklahoma under EPA's proposed FIP. Oklahoma firmly believes that further additional reductions from sources in Oklahoma are not needed, and if EPA makes such a

ODEQ Comments
Docket ID No. EPA-HQ-OAR-2008-0699
March 16, 2015

determination, Oklahoma expects that EPA will accept comment on such a finding in a proposed rule.

III. Transport

ODEQ supports EPA's proposed remedy to address the impacts of anthropogenic emissions from Texas. The Texas and Oklahoma SIPs agree that transport of air pollutants from Texas causes the majority of visibility impairment at Oklahoma's Class I Area so the emission reductions from Texas sources should be the most effective means to improve visibility in the Wichita Mountains. However, it is ironic that the CAA and EPA regulations justify more stringent actions to protect visibility by reducing transport than they do to protect public health under the ozone NAAQS by preventing the transport of ozone and ozone precursors to our downwind state during ozone season. While all areas in Oklahoma are currently designated attainment/unclassifiable, ODEQ special studies of ozone concentrations in counties along the Texas border demonstrate those areas are significantly impacted by transport from Texas.

IV. Conclusion

ODEQ supports the EPA's efforts to protect public health and the environment and appreciates the opportunity to provide the above comments.

OG&E Energy Corp

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April 20, 2015

Mr. Guy Donaldson
Chief, Air Planning Section (6PD-L)
U.S. Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Attention: Docket ID No. EPA-R06-OAR-2014-0754

Electronically uploaded to <http://www.regulations.gov>; Docket ID No. EPA-R06-OAR-2014-0754

Re: Regional Haze Plans for Texas and Oklahoma; Proposed Approval and Promulgation of Implementation Plans.

Dear Mr. Donaldson:

Oklahoma Gas and Electric Company ("OG&E"), respectfully submits these comments in response to the U.S. Environmental Protection Agency's ("EPA") simultaneously Proposed Regional Haze Federal Implementation Plans ("FIP") for Texas and Oklahoma ("Proposal" or "Proposed Rule")¹.

OG&E is the largest electric utility in Oklahoma, serving more than 800,000 customers across 30,000 square miles in Oklahoma and western Arkansas. Our service territory includes Oklahoma's state capital and most populous city, Oklahoma City as well as Ft. Smith, Arkansas, and some of the largest industrial consumers in the region. OG&E has the often-difficult job of providing our service territory with the power needed to thrive while balancing safety, reliability, affordability, and environmental responsibility.

Given OG&E's central role in supplying electricity for so many consumers in a growing state, and, as a stakeholder in many important EPA regulatory initiatives, we appreciate this opportunity to provide input to EPA on the proposed rule.

OG&E's Position on the Proposed Rule

OG&E supports the EPA Proposal that no additional emission controls for Oklahoma sources are currently needed² and that the cumulative actions being taken by Oklahoma

¹ 79 Fed. Reg. 74818 (December 16, 2014) "Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility"

² *Id.*

and Texas as well as other upwind states to comply with this and other EPA rules including the Cross State Air Pollution Rule (“CSAPR”) be accounted for in the next iteration of the evaluation of the Regional Haze program in Oklahoma.

Utilities in Oklahoma are well underway toward complying with the Regional Haze State Implementation Plan (SIP) and FIP for Oklahoma which, in addition to actions being taken by Oklahoma sources to comply with the Mercury and Air Toxics Standards (“MATS”) rule will achieve additional reductions in relevant emissions and impacts over 75%³ of the coal-fired generation in the state through the installation of controls, conversion to gas, or retirements.⁴ Furthermore, visibility in the Wichita Mountains National Wildlife Refuge (“Wichita Mountains”) is improving⁴ as visibility monitors in the Wichita Mountains are already close to meeting the Uniform Rate of Progress goal (“URP”) and achieving 2018 Reasonable Progress Goals (“RPG”) developed by Oklahoma in the 2011 SIP⁵. These actions will continue to reduce emissions dramatically in the current Regional Haze planning period ending in 2018 and into the next 10-year planning period ending in 2028.

Implementation Status for the Regional Haze Rule in Oklahoma

In 2011, EPA acted to partially approve and partially disapprove the Regional Haze SIP developed by Oklahoma and promulgated a FIP for the portions disapproved⁶. In that action, EPA stated that the NO_x controls adopted by the state meet the Clean Air Act Best Available Retrofit Technology (“CAA BART”) requirements; the SO₂ BART controls proposed in the FIP, in addition to the state adopted NO_x controls, would lead to significant improvement in visibility and meet the CAA BART requirements; additional NO_x controls would not be cost effective; and additional pollutant controls are not needed to meet the CAA BART requirements⁷. OG&E and other source operators in the state have begun to implement the compliance plans.

By this summer, low NO_x burner technology will have been installed on the four affected coal-fired units in the OG&E fleet, reducing NO_x emissions by over 50% from the coal-units. Low NO_x burners will be installed by the April 2017 compliance deadline on the remaining three SIP-affected units (gas-fueled boiler units). By 2019, OG&E will install dry flue gas desulfurization (“DFGD”) systems on two of the four affected coal units, reducing permitted SO₂ emissions by approximately 95%. OG&E will also convert two coal units to natural gas, virtually eliminating SO₂ emissions from these units after 2018.

Emissions reductions of NO_x and SO₂ in addition to that from the OG&E system in Oklahoma will occur due to the announced retirement of two Public Service of Oklahoma

³ EPA Air Markets Program 2014 available at <http://ampd.epa.gov/ampd>

⁴IMPROVE Summary Data website at: http://vista.cira.colostate.edu/DataWarehouse/IMPROVE/Data/SummaryData/RHR_2013/SIA_group_means_7_14.csv

⁵ 76 Fed. Reg. 16176 (March 22, 2011)

⁶ 76 Fed. Reg. 81728 (December 28, 2011)

⁷ *Id.* at 81754

(“PSO”) coal-fueled units, one in 2016 and one in 2026 as well as from the retirement of one of the Grand River Dam Authority (“GRDA”)’s units at its Choteau facility.

The Proposed Rule – No Further Emission Reduction Needed From Oklahoma Sources

As described in the Proposal, analysis by the Oklahoma Department of Environmental Quality (“ODEQ”) shows that contributions to visibility impairment in the Wichita Mountains come not only from in-state emission sources, but also sources upwind in Texas and the eastern United States⁸. With regard to addressing contributions from in-state sources, OG&E agrees with EPA’s determination that no further reductions are required from emission sources in Oklahoma in the planning period ending in 2018⁹. Regardless of the outcome of the Proposal concerning the implementation of the FIP for Texas, EPA should maintain this determination regarding Oklahoma in the final rule.

In the Proposal, EPA noted improvements in visibility in the Wichita Mountains as measured by the visibility monitoring system operated by the U.S. Fish and Wildlife Service in the Wichita Mountains. Specifically, EPA notes that for the most recent 5-year period for which data is available (2009-2013), average conditions for the 20% worst days is 21.2 deciviews (“dv”), below the 21.47 dv RPG developed by ODEQ for 2018¹⁰. Indeed, annual summary data from the IMPROVE program website shows that 2012 and 2013 visibility is very near the ODEQ URP goal for 2018 of 20.01 dv and better than ODEQ developed for the 2018 RPG – 2012 was measured at an annual average of 20.17 dv and 2013 (the most recent year for which finalized data is available) was measured at 20.15 dv¹¹.

This data favors the EPA’s determination that no additional emission reductions for sources in Oklahoma are warranted in the planning period ending in 2018 and beyond, especially when combined with the significant emissions reduction measures currently being implemented.

Review the Need for Further Emission Reductions in Future Planning Periods

Promulgating a requirement for further emission controls related to visibility in the Wichita Mountains appears unnecessary at this time. Not only are sources in Oklahoma reducing emissions as a result of a number of federal requirements¹², but sources in contributing states will be as well. It would be prudent for EPA to allow states to assess the efficacy of these and any additional reductions in a future planning period.

Conclusion

⁸ 79 Fed. Reg. 74821 (December 16, 2014)

⁹ *Id.* at 74823

¹⁰ *Id.* at 74870

¹¹ See *Supra* note 4

¹² Such requirements include Regional Haze/BART, MATS, CSAPR, ozone NAAQS, and SO₂ NAAQS, among others.

As evidenced by the ODEQ SIP and the Proposed Rule, Oklahoma and EPA do not believe further emission reductions are needed from Oklahoma sources at this time and may not be needed in the near future. Oklahoma is currently making significant emissions reductions from its coal-fired fleet and visibility monitoring in the Wichita Mountains class 1 area is improving even before a large slate of emission reduction programs by the power sector has been fully implemented over the next roughly 10 years. OG&E believes the final rule should affirm it is not necessary to impose additional emission control requirements at this time from utilities in Oklahoma.

OG&E appreciates the opportunity to provide comments to this Proposed Rule and encourages the Agency to give our comments due consideration. If you have any questions, please contact me at (405) 553-3000.

Sincerely,

A handwritten signature in black ink, appearing to read "Usha-Maria Turner", written over a horizontal line.

Usha-Maria Turner

Director

Corporate Environmental

**COMMENTS BY THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
REGARDING THE PROPOSED TEXAS AND OKLAHOMA REGIONAL HAZE
FEDERAL IMPLEMENTATION PLAN AND INTERSTATE TRANSPORT STATE
IMPLEMENTATION PLAN TO ADDRESS POLLUTION AFFECTING VISIBILITY
AND REGIONAL HAZE**

DOCKET ID NO. EPA-Ro6-OAR-2014-0754

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I. Summary

On December 16, 2014, the United States (U.S.) Environmental Protection Agency (EPA) published in the *Federal Register* a notice of proposed rulemaking regarding the Texas and Oklahoma regional haze federal implementation plan (FIP) and interstate transport state implementation plan (SIP) to address pollution affecting visibility and regional haze (79 FR 74818). The Texas Commission on Environmental Quality (TCEQ) provides the following comments on this proposed rule.

For purposes of abbreviation, the Texas 2009 Regional Haze SIP Revision may be shortened to the 2009 RH SIP. Big Bend National Park may also be referred to as Big Bend; Guadalupe Mountains National Park as Guadalupe Mountains; and Wichita Mountains Wilderness as Wichita Mountains.

II. Comments

A. General Comments

A.1. The TCEQ does not support the proposed partial disapproval of Texas' RH SIP or adoption of the proposed FIP. The EPA's proposed partial SIP disapproval and FIP ignores the flexibility the Federal Clean Air Act (FCAA) provides to states in crafting regional haze plans and thus is arbitrary, capricious, and an abuse of discretion. The EPA should withdraw this proposal and propose to approve the TCEQ's 2009 RH SIP as meeting the statutory and regulatory requirements for regional haze.

COMMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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The TCEQ submitted a RH SIP that meets all requirements of the Federal Clean Air Act (FCAA) and the regional haze rule (RHR). The 2009 RH SIP includes a detailed analysis of each requirement of a regional haze plan, as identified in FCAA, §169A(b)(2) including: a determination of which sources are subject to Best Available Retrofit Technology (BART); reasonable progress goals for the state's Class I areas, based on the four statutory factors; calculations of baseline and natural visibility conditions; consultations with states; and a long-term strategy and a monitoring strategy.

The EPA bears the burden to show Texas' judgment was unreasonable or does not meet the statutory requirements. As the U.S. Supreme Court opined in *Alaska Dept. of Environmental Conservation v. EPA* (540 U.S. 461, 484-89 (ADEC)): in reviewing an EPA disapproval of a state's exercise of discretion, courts must defer to state judgments, and the EPA bears the burden of establishing that those judgments were unreasonable. States are due even greater deference under FCAA, §169A (USC 7491) than under the standard articulated under the Supreme Court's decision in *ADEC*.¹ The RHR and EPA guidance suggest that states have a large degree of flexibility in crafting regional haze plans.

The EPA's determination that the TCEQ did not meet all applicable requirements of the FCAA regarding regional haze is flawed. The state plan submitted in 2009 followed all the EPA rules and guidance and contains a thorough analysis and justification for its conclusions for each statutorily required element. The EPA states that the TCEQ did not 'reasonably consider' the four statutory factors in developing the reasonable progress goals (RPG) for its Class I areas, Big Bend and Guadalupe Mountains National Parks. The FCAA requires states to develop RPGs "tak[ing] into consideration" the factors listed in §169A(g)(1). Texas' plan does this. The EPA's complaint is that it would have considered these factors differently than Texas. This is not a valid basis for disapproval of the Texas plan. The EPA proposes to find that it would have developed certain elements of the visibility plan differently, thus holding Texas to a different standard of compliance than what is provided for in statute and rule. This is the very nature of an arbitrary and capricious action. The EPA also proposed that the Texas uniform rate of progress (URP) is faulty because it assumes the TCEQ's natural visibility conditions estimate is incorrect.² This is an estimate that was developed by the TCEQ following the EPA's own guidance and rules that provide the states broad flexibility and discretion in their calculation. Again, it appears the EPA prefers a different outcome than that of the Texas plan. The EPA's proposed disapproval of the long-term strategy for Wichita Mountains in Oklahoma is based on new and unfounded interpretations without basis in the FCAA or its rules. First, the EPA claims that the four statutory factors for RPGs apply to the long-term strategy. This is not found in the statute and is not supported by the RHR. The EPA also proposes disapproval of the long-term strategy and state consultations - in which both states agreed with the reductions calculated for sources in Texas that impacted the Wichita Mountains - because Oklahoma's 'progress goal' established for Wichita Mountains must be "approved or approvable" in order for Texas to rely on it in its own plan.

It appears that the EPA has carried out the process of developing its proposed partial SIP disapproval and proposed partial FIP in the following sequence: First, the EPA decided to find a way to impose additional control requirements beyond those in Clean Air Interstate Rule (CAIR) on multiple electric generating units (EGU) in Texas. The EPA then analyzed the Texas 2009 RH SIP using new approval criteria that were not in place in either the RHR or in the EPA's

¹ See *American Corn Growers Assn. v. EPA*, 291 F.3d., 1 (2002).

² "...we propose to find the TCEQ has calculated this rate of progress on the basis of, and compared baseline visibility conditions to, a flawed estimation of natural visibility conditions for the Big Bend and Guadalupe Mountains, as we describe above. Therefore, we propose to disapprove the TCEQ's calculation of the URP needed to attain natural visibility conditions by 2064." 79 FR 74818, 74833

COMMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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guidance when it was submitted in 2009. Again, the EPA's proposed partial SIP disapproval and FIP is an attempt to force its preferred outcome for specific sources in Texas. This is arbitrary and capricious and does not comport with the FCAA.

A.2. The projected visibility improvement from the proposed FIP requirements are imperceptible at all three Class I areas. The EPA's modeling analysis projects that the combined effect of all the proposed scrubber upgrades (for seven individual units at four sites) will achieve at most only an imperceptible improvement of 0.14 deciviews at Wichita Mountains. Even smaller improvements are projected for Big Bend and Guadalupe Mountains, 0.03 and 0.04 deciviews, respectively. Tables 44 and 45 in the preamble exaggerate the potential benefits of the EPA's proposed FIP and are irrelevant to the approvability of the 2009 RH SIP.

As fully explained in comment J.6., both Table 44: *Calculated RPGs for 20% Worst Days...* and Table 45: *Anticipated Visibility Benefit...* should be removed from the final action because they tabulate calculated benefits that will not occur by 2018, the only year that is appropriate for evaluating the visibility impacts of proposed controls. The 2018 visibility conditions that the 2009 RH SIP will produce are the appropriate starting points for evaluating the effects of the EPA's proposed FIP. Table 45 misleads a reader to believe that the EPA's proposed FIP action would produce a 0.62 deciview improvement in visibility at Wichita Mountains. Instead of calculating a benefit from the air quality that the 2009 RH SIP would produce in 2018, Table 45 misleads the reader by calculating "benefits" from 2011 through 2013 emissions, long before the 2009 RH SIP is fully effective instead of from 2018.

Table 43 in the Preamble presents the calculated benefits in 2018 that could result from the EPA's proposed FIP. However, the potential 0.14 deciview improvement at Wichita Mountains is almost certainly an overstatement of the incremental benefit from the proposed FIP in 2018 because SO₂ emission reductions are occurring due to other requirements, and the actual SO₂ emissions will likely be lower than those in the CENRAP 2018 emissions projections.

Typically, a person can perceive a one (1.0) deciview change in visibility impairment. Visibility differences of 0.14, 0.04, and 0.03 deciview are imperceptible.

Table 1. Visibility Data (in Deciviews)³			
	Big Bend	Guadalupe Mountains	Wichita Mountains
Baseline Visibility Impairment 2000 - 2004	17.30	17.19	23.81
State-established RPG for 2018	16.60	16.30	21.47
Incremental 2018 Improvement from EPA's Proposed FIP Scrubber Upgrades	0.03	0.04	0.14
EPA-proposed RPGs for 2018	16.57	16.26	21.33
Current Visibility 2009 - 2013	16.30	15.30	21.20

³ From Table 43, (79 FR 84887), and the Western Regional Air Partnership-Technical Support System (WRAP-TSS)

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Also, the potential improvement from the proposed FIP is 2% or less of the total impairment projected to exist in 2018 on the most impaired 20% days and even that is likely an overestimate of the FIP's potential benefit because the EPA's analysis does not consider the reductions that will occur from other federal programs, such as the Mercury and Air Toxics Standards (MATS) rule and the implementation of the sulfur dioxide (SO₂) National Ambient Air Quality Standard (NAAQS).

The actual effects of the EPA's proposed FIP are correctly represented in Table 43, which includes the only controls that could be in place by the end of 2018, which is the end of the first regional haze planning period established by the RHR.

With current monitored visibility better than the EPA calculates the proposed FIP would achieve in 2018 and the potential visibility improvements from the proposed FIP are both small and uncertain, the EPA does not have an appropriate basis for adopting the proposed FIP.

A.3. The Texas 2009 RH SIP, as submitted, would ensure more than Texas' proportional contribution to progress toward improved visibility conditions at Wichita Mountains through the first planning period that runs through 2018.

By 2018, Texas' 2009 RH SIP reduces Texas' apportioned contribution to total visibility extinction at Wichita Mountains by more (26.1%) than the reduction from all other states combined (24.5%). Also, Texas' 2009 RH SIP reduces Texas' visibility impairment impact at Wichita Mountains by slightly more than its proportional share of the total baseline visibility impact at Wichita Mountains. Additionally, the Central Regional Air Planning Association (CENRAP) states were in agreement about the amount of progress that was reasonable at Wichita Mountains during the first planning period.

The EPA's proposed partial SIP disapproval and partial FIP undervalue the effectiveness of the long-term strategy embodied in the Texas 2009 RH SIP. Without presenting evidence, the EPA dismisses the progress made as being due to "meteorological conditions, reduction in the impacts from SO₂ emissions, and a reduction in the impacts from coarse materials" (79 FR 74843). The EPA makes the meteorological assertion in spite of the fact that 2011 was one of the hottest and driest years in Texas history and there were unprecedented wildfires that year. The current visibility conditions in Big Bend, Guadalupe Mountains, and Wichita Mountains are already better than the respective state-established and the EPA-proposed RPG for these three Class I areas.

A.4. The requirements in the proposed FIP are untimely for the first regional haze planning period due to the EPA's delay in acting on the 2009 RH SIP submittal.

The EPA is evaluating the approvability of the Texas 2009 RH SIP, which covers the first planning period that runs only through 2018. The EPA has been so untimely in its review of the 2009 RH SIP that only the proposed scrubber upgrades in the proposed FIP could possibly be in place by the end of 2018. The projected benefit of the other proposed FIP controls, the scrubber retrofits, is irrelevant to the approvability of Texas' 2009 RH SIP because they would not be in place during this first planning period.

A.5. Texas disagrees with the EPA's technical approach of evaluating only Texas sources when considering more controls to reduce haze at the Wichita Mountains.

In preparing its proposed actions, the EPA carried out a technical project evaluating the connection between emissions of SO₂ and nitrogen oxides (NO_x) from 38 sources in Texas and visibility impairment at several Federal Class I areas.⁴ The EPA's approach to evaluating the

⁴ The 38 Texas sources evaluated are: Big Brown, Big Spring Carbon Black, Borger Carbon Black, Borger Carbon Black Plant, Coletto Creek Plant, Fayette Power Project, Fullerton Gas Plant, Gibbons Creek,

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possibility that it might be reasonable to add additional controls to sources of visibility-impairing pollutants is inherently arbitrary and capricious, biased, discriminatory, and unreasonable because, while focusing primarily on the Wichita Mountains in Oklahoma, the approach considered only sources in Texas for possible additional controls. The approach did not consider whether additional controls on sources in Oklahoma, Arkansas, Kansas, or New Mexico may be equally reasonable or more reasonable. The existing EGUs in Texas and the other states surrounding Oklahoma as well as in Oklahoma are in the same category in that they have all been subjected to BART requirements or better-than-BART requirements.

A.6. The EPA's action is based not on current law or guidance but rather the agency's preference of what the law and guidance should be. This is apparent from recent meetings the EPA has conducted with regional planning organizations (RPOs), federal land managers (FLMs), and states on possible changes to the RHR and guidance – changes that in many ways would codify the approach that the EPA has taken in proposing disapproval of the Texas and Oklahoma SIPs.

The EPA has indicated intentions to revise the RHR and guidance and is in the process of holding meetings with relevant stakeholders such as states, FLMs, and RPOs to receive feedback and input on what these revisions should entail. This is the correct approach for an agency considering making changes to properly promulgated rules. Several stakeholders have already expressed to the EPA that the agency needs to more clearly articulate expectations in the rule or guidance for how to consider the four statutory factors used in setting RPGs. The EPA has posed a series of questions to stakeholders on how to revise the RHR and guidance, including how states should address each RPG factor. For example, the EPA asks if the RPG analysis should include a presumption that certain controls are needed for reasonable progress. This is precisely what the EPA has done in reviewing the Texas 2009 RH SIP and developing the proposed FIP, an action that is without a basis in the current regulations. If the EPA finds that in its review of state RH plans there are flaws in its own rules, the appropriate mechanism for correcting those flaws is not disapproving those plans; it is through prospective, FCAA-compliant rulemaking. The EPA must base its review of the Texas 2009 RH SIP on what the rule and guidance required at the time Texas submitted the plan in 2009. Changes to the law must be properly made through notice and comment rulemaking and not imposed prematurely and without notice to states after plans are submitted. It is arbitrary and capricious, as well as contrary to current case law, to require a state to guess what the EPA may choose to require from a state for an approvable plan. The EPA had appropriate rules and guidance, these were correctly and appropriately followed by the TCEQ in developing the 2009 RH SIP, and the EPA is obligated to follow its own rules and guidance that were in place when the plan was developed as it evaluates the merits of the submission.

B. Visibility Transport

The EPA's interpretation of the RHR is unprecedented, incorrect, and unreasonable. The EPA exceeded its authority in disapproving Texas' long-term strategy.

Goldsmith Gasoline Plant, Great Lakes Carbon LLC, Guadalupe Compressor Station, Harrington Station, Holcim (Texas) LP, HW Pirkey Power Plant, Keystone Compressor Station, Keystone Plant, Lignite-Fired Power Plant, Martin Lake Electrical Station, Midlothian Plant, Monticello Steam Electric Station, Newman Station, North Texas Cement Co., Odessa Cement Plant, Oklaunion Power Station, Pegasus Gas Plant, Reliant Energy Limestone, Sandow Steam Electric, Sherhan Plant, Sommers Deely Spruce Power, Streetman Plant, Texarkana Mill, TNP One Steam Electric Station, Tolk Station, W A Parish Station, Waha Plant, Welsh Power Plant, Works No 4, and Sandow 5 Generating Plant.

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The EPA has misinterpreted the requirements in FCAA, §§51.308(d)(1) and (d)(3) and improperly gives meaning to a phrase in order to fill a perceived gap in their own regulations. The RHR requires upwind states to consult with downwind states and develop coordinated strategies to address the upwind state's share of impairment in the downwind state's Class I areas that are impacted. Texas met these long-term strategy requirements. As the EPA admits on 79 FR 74856, in its evaluation of the consultation with Oklahoma, both states agreed with the 2009 Texas plan. Therefore Texas met its obligation under the RHR for the long-term strategy assessment for Class I areas outside the state, specifically Wichita Mountains. The EPA may be correct that its own rules do not address situations where a downwind state's RPG for an area is not properly set, but that does not give the EPA the authority to arbitrarily revise its rules ad hoc, without the proper notice and comment procedures; nor does the flaw in the EPA's rules mean that the Texas plan addressing the long-term strategy is deficient.

The EPA exceeded its authority in disapproving Texas' long-term strategy. First, the EPA bases its proposed disapproval of the RPG and long-term strategy on a new interpretation of FCAA, §51.308(d)(3)(ii) that the 'progress goal' established by a downwind state, i.e. Oklahoma, must be "approved or approvable." This new definition in 2014 of the term progress goal in order to justify the proposed disapproval of the 2009 RH SIP is arbitrary and capricious. The EPA is proposing to disapprove Texas' portion of the RPG calculation for Wichita Mountains, not because of a flaw in Texas' analysis, but because the EPA does not agree with Oklahoma's RPG. The EPA maintains that in this case, it must disapprove both Texas and Oklahoma's plans regarding Wichita Mountains. This interpretation is not found in the rule or statute and is not legally valid for reviewing Texas' long-term strategy or RPG. In fact, the FCAA, §51.308(d)(1) standard for determining the acceptability of the RPG is "it must provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period." The EPA agrees that both Texas' RPGs for Big Bend and Guadalupe Mountains and Oklahoma's RPG for Wichita Mountains meet this requirement (79 FR 74834).⁵

In developing its long-term strategy for impacts to Wichita Mountains, Texas relied on an agreed upon approach to emission reductions. Oklahoma and Texas both agreed to the Texas SIP long-term strategy during consultation. Texas' long-term strategy was based partly upon meeting the RPG for Wichita Mountains established by Oklahoma. That plan and those consultations are what the EPA must review for compliance with the FCAA. The EPA also relies on an incorrect interpretation of the long-term strategy requirements in (d)(3). Texas is not required to consider the four statutory factors for Class I areas outside the state. These factors are considered in the determination of 'reasonable progress' in FCAA, §169A(g)(1) for Class I areas located in the state. For Class I areas located outside the state, Texas is required to consult with those 'downwind' states in developing coordinated emissions management strategies *as may be necessary* to achieve the RPGs established by the host state.⁶ In establishing its long-term strategy, the TCEQ properly relied on its consultation and concurrence with Oklahoma at the time the Texas 2009 RH SIP was developed. That consultation resulted in concurrence that controls - additional to those already required under existing regulations - were not reasonable for Texas sources. The EPA is changing the rules after the fact to give a never before used meaning to 'progress goal' that those goals for Oklahoma must be approved or approvable in order to approve Texas' long-term strategy. The EPA cannot rely on the deference from the

⁵ Once again, the EPA engages in creative interpretation of its rules that is not based in the FCAA. The EPA maintains that "ODEQ's RPGs for the Wichita Mountains are consistent with *minimum* requirements of §51.308(d)(1)...." (emphasis added) This section of the rule makes no mention of a minimum level of progress and in fact provides all of the requirements for what the RPG must provide.

⁶ For Wichita Mountains, the host state is Oklahoma. See 40 CFR §51.308(d)(3).

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courts as this interpretation is inconsistent with the regulation and clearly not found in the RHR.

C. Natural and Baseline Visibility Conditions

C.1. The natural conditions estimates that the EPA proposes are not technically supportable and should be withdrawn. The EPA failed to meaningfully address Texas' justification for its RPG and natural visibility condition analysis. The TCEQ urges the EPA to approve Texas' estimation that 100% of the coarse mass and fine soil observed at Big Bend and Guadalupe Mountains is the best estimation available.

The EPA's proposal to use the Natural Conditions II (NCII) Committee estimations of natural conditions for coarse mass, i.e., dust, and fine soil, ignores the site-specific evidence and analysis presented on page 5-4 of the 2009 RH SIP. Further information and evidence is presented clearly in the appendices and in peer-reviewed scientific publications that are cited.⁷

The technical evidence submitted in the 2009 RH SIP demonstrates that, on the most impaired 20% of days, the suspended soil (coarse mass and fine soil) at Guadalupe Mountains and Big Bend is best estimated by calculating that 100% of the soil is natural. The TCEQ asks the EPA to take note of the following conclusion in Chapter 5, page 5-4, the second paragraph of the 2009 RH SIP:

The times when human-caused dust is likely to be more important at these sites are on days with less visibility than on the worst dust impaired days, since the most dust impaired days are dominated by dust storms and other blowing dust from the surrounding desert landscapes.

In the proposal, the EPA correctly states:

We note that with any of the methodologies for calculating natural conditions discussed above, Texas' Class I areas are not projected to meet the URP in 2018 according to the CENRAP modeling and are not projected to meet the goal of natural visibility conditions by 2064 (79 FR 74832).

Importantly however, the EPA failed to note that, since over 50% of the visibility impairment at Big Bend on the most impaired 20% days comes from outside the U.S. and since there is no basis for projecting a reduction in that impact, the goal of reaching natural conditions at Big Bend is unrealistic, as is the implied goal of attaining the URP at any time. A more appropriate goal would be to achieve an appropriate reduction of the visibility impairment caused by anthropogenic emissions in Texas and the rest of the U.S.

The TCEQ correctly calculated natural visibility conditions at Big Bend and Guadalupe Mountains in accordance with FCAA, §51.308(d)(2)(iii) and EPA guidance. The use of a refined estimate is allowed under the rule and guidance. The EPA's determination that this refined approach to estimating natural visibility conditions is "not adequately demonstrated" is improper. Such a basis for review is not found in rule, statute or guidance. The EPA cites "uncertainty" in the TCEQ's assumptions yet the EPA's proposed disapproval and use of the default NCII values is contrary to the evidence presented in the 2009 RH SIP and is unjustified. The EPA admits that dust storms and blown dust from deserts, in a very arid region, are

⁷ See Appendix 5-1: Discussion of the Original and Revised Interagency Monitoring of Protected Visual Environments (IMPROVE) Algorithms; Appendix 5-2: Estimate of Natural Visibility Conditions; Appendix 5-2a: Natural Events: Dust Storms in West Texas; Appendix 5-2b: Estimating Natural Conditions Based on Revised IMPROVE Algorithm; Appendix 5-2c: Texas Natural Conditions SAS Program File and Data; see under References - Gill et. al. 2005; Kavouras et. al. 2006, 2007.

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significant contributors to impairment in Big Bend and Guadalupe Mountains. The EPA's preference for the default estimates is equally unjustified. It is reasonable to assume coarse mass and dust as 100% naturally sourced for the natural visibility estimate for these areas that are located in a desert environment and close to sources of wind-blown dust. The EPA has not demonstrated that the TCEQ's estimate violates the rule or runs afoul of guidance, or is more uncertain than using the default values. Just because everyone else used the default is not a valid basis for disapproval given that the EPA's rules allow such a refined approach.

C.2. If the EPA does not approve the TCEQ natural conditions estimation that 100% of the soil dust at Big Bend and Guadalupe Mountains on the 20% most impaired days is natural, it should choose an estimate between the 80% natural estimate and 100% approximation.

The FLMs commented that 80% would be more reasonable, but they did not present evidence to support this suggestion. However, the TCEQ considers that 100% is well supported in the 2009 RH SIP.

C.3. Texas agrees with the proposed EPA finding that the TCEQ's estimate of baseline visibility conditions at Big Bend and Guadalupe Mountains have satisfied the requirements of §51.308(d)(2)(i).

D. Natural Visibility Impairment

D.1. In Section V. B. 3 of the preamble, the EPA has mischaracterized the requirement for states to calculate natural visibility impairment beyond natural conditions. Table 3: *Natural Visibility Impairment* on page 7483a of the proposal is an incorrect and misleading characterization of Chapter 5, Table 5-2: *Visibility Metrics for the Class I Areas in Texas*, page 5-4 of the 2009 SIP. The TCEQ disagrees with the EPA's assessment of compliance with this requirement and urges the EPA to approve TCEQ's appropriate and technically defensible estimates of natural conditions, such as those used in the 2009 RH SIP.

Section 51.308(d)(2)(iv)(A) of the RHR says:

For the first implementation plan addressing the requirements of paragraphs (d) and (e) of this section, the number of deciviews by which baseline conditions exceed natural visibility conditions for the most impaired and least impaired days...[underline added]

Although the EPA appropriately proposes to find that the 2009 RH SIP correctly stated the baseline conditions at Big Bend and Guadalupe Mountains, the subsection just cited requires that the natural visibility conditions for the most and least impaired days at each Class I area be subtracted from the baseline conditions for the most and least impaired days to determine the number of deciviews by which baseline conditions exceed natural conditions on the respective sets of days.

D.2. The TCEQ urges the EPA to accept the use of 100% natural dust as the most reasonable estimate for calculating natural conditions. The EPA's proposal presents no evidence that human activity contributes to the coarse mass or fine soil (dust) at Guadalupe Mountains or Big Bend.

The EPA did not do what the rule requires to calculate natural conditions "by estimating the degree of visibility impairment existing under natural conditions for the most impaired and least impaired days, based on available monitoring information and appropriate data analysis

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techniques.”⁸ Since the Texas 2009 RH SIP did present substantial evidence that natural blowing dust is the cause of the coarse mass and fine soil at both parks on the 20% of days with the most visibility impairment, the TCEQ strongly urges the EPA to accept the use of the 100% approximation.

D.3. If the EPA chooses not to accept that estimate or to withdraw its proposed partial SIP disapproval and FIP, the TCEQ urges the EPA to choose an estimate that the dust is between 80% and 100% natural.

The 2009 RH SIP submittal presented strong, peer-reviewed publication evidence that, on the most impaired 20% of days, essentially all the coarse mass and fine soil at Guadalupe Mountains National Park is natural. It also presented evidence assembled by six scientists, including the chairman of the IMPROVE steering committee, that the dust impacts at Big Bend are largely from locally windblown dust. Because of the strong National Park Service restrictions on human activity in Big Bend and the fact that the IMPROVE monitor in Big Bend is surrounded in all directions by 10 or more miles of the park, the conclusion is that naturally eroded soil contributes all or nearly all the coarse mass and fine soil at Big Bend on the 20% of days with the most impaired visibility. The FLMs commented that an approximation of 80% natural would be more reasonable, but they did not present evidence to support this suggestion.

E. Uniform Rate of Progress (URP)

Texas disagrees with the EPA's proposed URP and natural conditions for both the Texas Class I areas. Once a final, technically supportable estimate of natural conditions has been selected, the URP can be calculated by straight-line interpolation from the baseline visibility conditions (2000 – 2004) to the estimated natural conditions in 2064 for each of the Texas Class I areas.

Importantly, the EPA failed to note that, since over 50% of the visibility impairment at Big Bend on the most impaired 20% days comes from outside the U.S. and since there is no basis for projecting a reduction in that impact, the goal of reaching natural conditions at Big Bend is unrealistic, as is the implied goal of attaining the URP at any time.⁹ A more appropriate goal would be to achieve an appropriate reduction of the visibility impairment caused by anthropogenic emissions from Texas and the rest of the U.S. Later in the first full paragraph on page 79 FR 74843, the EPA correctly concluded that “it is not reasonable to meet the URP for the Texas Class I areas for this planning period.” The EPA also recognized that “emissions and transport from Mexico and other international sources will limit the rate of progress achievable on the 20% worst days...”

F. Reasonable Progress Goals

F.1. The TCEQ agrees with the EPA's proposal to find that Texas' submission meets the requirements of §51.308(d)(1)(iv) regarding reasonable progress goal minimum and state consultations for the two Texas Class I areas.

F.2. The EPA's proposed disapproval of Texas' RPGs and its substitution with new RPGs in the proposed FIP is based on EPA's flawed interpretation of what the FCAA requires for “reasonable progress goals.” This action is based on the EPA's conclusion that “reasonable progress” must be determined based on source-specific cost of controls even though such a requirement did not exist in the statute, the RHR, or the guidance available in 2009.

⁸ See 40 CFR §51.308(d)(2)(iii).

⁹ See the EPA's approval of Arizona's natural conditions goal of 767 years out for Saguaro East in 79 FR 52469.

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The Texas 2009 RH SIP established RPGs for both Big Bend and Guadalupe Mountains that provide for visibility improvement for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period. The EPA agrees the SIP meets these requirements. The EPA also agrees that the TCEQ considered the four statutory factors in establishing the RPGs for its Class I areas, in accordance with the RHR. The RHR requires states to establish RPGs that "...must provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period" (§51.308(d)(1)). The four statutory factors in subparagraph (i) are factors the state must consider in developing the RPGs. These factors in and of themselves do not determine the reasonableness of the goals for the planning period. The RHR, in 40 Code of Federal Regulations (CFR) §51.308((d)(1)(iii), requires the EPA to evaluate whether the state's goal for visibility improvement provides for reasonable progress based on a demonstration of which the four statutory factors are only one element. The EPA's proposed disapproval is a substitution of Texas' statutory responsibility with their own flawed interpretation of what the "reasonable progress goals" must provide and how they are to be determined. This action is based on the EPA's conclusion that 'reasonable progress' must be determined based on source-specific cost of controls even though there is no statutory, regulatory, or precedential basis for this conclusion.

G. Reasonable Progress Four Factor Analysis and Consultation

G.1. The EPA has no basis to disapprove the state's RPGs because the TCEQ did not examine the four statutory factors on a unit-by-unit basis. The TCEQ's analysis of the statutory factors using a source category approach was consistent with the statute, the RHR, and the existing EPA guidance.

Neither FCAA, §169A, the RHR, nor the guidance available in 2009 required a unit-by-unit four factor analysis even where the state's RPGs would improve visibility less than the URP. The statute simply provides that in determining reasonable progress, the four statutory factors shall be taken into consideration (§7491(g)(1)). The statute does not direct how. The RHR provides the same in 40 CFR §51.308(d)(1)(i)(A). In addition, the EPA's RPG guidance does not refer to a unit-by-unit four factor analysis but instead says that states have "flexibility" in how to consider the factors. The EPA has failed to establish that Texas' RPGs do not meet the RHR for improvement in visibility for the most impaired days and no degradation for least impaired days. The EPA also fails to establish that Texas' determination - that additional controls are unnecessary and that they would not provide a discernable visibility improvement for the added cost - is unreasonable based on the text of the FCAA and the EPA regulations.¹⁰ The EPA itself supported the non-source specific four factor analysis approach in reviewing New Mexico's regional haze plan. In a challenge to New Mexico's plan, the EPA "points out that

¹⁰ Dissent in *Oklahoma et al v. EPA* (challenges to the EPA's SIP disapproval and FIP of Oklahoma's RH BART determinations.) 10th circuit July 2013, pages 4-5:

"Finally, it is worth noting that the EPA's regional haze program is distinct in the amount of power given to the states.....There are a number of reasons for this approach, not the least of which is that its goals and standards are purely aesthetic rather than directly related to health and safety. The EPA's rule here requires OG&E to make a \$1.2 billion investment over the next five years that will, even under EPA's estimate, result in no appreciable change in visibility....

Although the EPA has at least some authority to review BART determinations within a state's SIP, it has no authority to condition approval of a SIP based simply on a preference for a particular control measure. *Texas v. EPA* 690 F3d 670,684 (5th Cir. 2012) see *EME Homer City Generation L.P. v. EPA* 696 F3d 7, 29 (D.C. Cir. 2012) (reviewing a different rule and concluding that the FCAA 'prohibits EPA from using the SIP process to force states to adopt specific control measures'). Oklahoma considered the cost and resulting benefit of such a large investment in scrubbers, and its conclusion was not unreasonable."

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[§51.308(d)(1)(i)(A)] does not require a source-specific analysis.”¹¹ The 10th Circuit agreed that “[N]either the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in determination of reasonable progress.” (*id*) The EPA has also ignored its own words from the RHR preamble: “....EPA is not specifying in this final rule what specific control measures a State must implement in its initial SIP for regional haze. That determination can only be made by a State once it has conducted the necessary technical analyses of emission, air quality, and the other factors that go into determining reasonable progress” (64 FR 35721).

G.2. The TCEQ disagrees with the EPA’s conclusion that \$2,700 per ton was too low of a threshold for cost-effective controls.

The EPA stated that CAIR was considered acceptable in lieu of BART but not necessarily designed as a reasonable progress strategy. The TCEQ selected the \$2,700 per ton threshold because it was used in the CAIR analyses to control NO_x and SO₂. CAIR was a contemporary program designed for controlling primary and precursor pollutants for health-based ozone and particulate matter NAAQS. The cost rate was not selected because CAIR was considered acceptable for BART, but because it met the high standards for a health-based emissions reduction program. And thus, it was considered more than adequate for the standards of a visibility-based program.

G.3. The TCEQ disagrees with the EPA’s assertion that an analysis of controls for a group of sources should not have been performed because this grouped analysis hid potential improvements of smaller-costing controls from individual equipment.

Site specific analyses were not considered necessary because visibility improvements from a group were not perceptible. Thus, a subset of the sources could not result in a better controlled approach or improvement in the visibility predicted by the larger group. The TCEQ performed a grouped source analysis because it was allowed under the EPA’s rule and the guidance available at the time the analysis was performed.

G.4. The TCEQ disagrees with the EPA’s approach of requiring emissions reductions at certain sites, not necessarily because the reduction had any perceptible improvement in visibility at a Class I area, but because emissions from that source may be significant when compared to other sources.

Reductions to sources that do not have any perceptible impact are not effective regardless of their cost. The regional haze program is designed to improve visibility. The analysis approach completed by the TCEQ was to determine potential, cost-effective controls that would have a perceptible impact on visibility at a Class I area. The program was not designed to make reductions because reductions were possible, nor is that required by either the FCAA or the RHR.

Texas analyzed emissions reductions using four factor analysis, as required by the EPA’s RHR (64 FR 35766). Emissions reductions were estimated for sources with the potential suite of controls selected using a \$2,700 per ton threshold. A four factor analysis was performed on this group of sources; no perceptible visibility improvement was determined. The goal of the regional haze program is to focus on reasonable progress towards visibility improvement at each Class I area, not to target reductions at specific sources. The EPA appears to have performed its control analysis in the proposed FIP in a reverse-logic form. It targeted reductions at larger-emitting sources, only because they are larger emitting, not through an application of the reasonable progress four factor analysis on potential controls when considering perceptible progress towards achieving natural visibility.

¹¹ See *Wildearth Guardians v. EPA*, 770 F3d 919, 944.

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G.5. The TCEQ disagrees with the EPA's position that it was unreasonable for Texas not to ask for site-specific data to perform a site-specific analysis because the TCEQ does not have the legal authority to require companies to submit the information necessary to properly evaluate flue gas desulfurization (FGD) scrubber upgrades. It is unreasonable for the EPA to expect the TCEQ to perform an analysis of scrubber upgrades on the specific EGUs when only the EPA has the legal authority to obtain the necessary information to conduct such an analysis.

The EPA stated in its Cost Technical Support Document and in the *Federal Register* notice that the nature of acceptable scrubber upgrades is site-specific and the data were not publicly available. Under FCAA, §114(a), the EPA required companies to submit detailed information regarding the facilities' current scrubber systems and any improvements that have been made since initial installation. The EPA indicated the information was necessary in order to properly evaluate the potential for upgrades to the FGD scrubbers (79 FR 74876).

The TCEQ agrees that such extensive knowledge of the existing scrubber systems is necessary to properly evaluate the viability of upgrading an FGD scrubber. However, the TCEQ does not have any authority equivalent to the EPA's authority under FCAA §114(a) to require submission of cost data or design requirements for a suite of potential scrubber upgrades at individual sites. The TCEQ cannot require the companies to provide the information that the EPA admits is necessary to evaluate FGD scrubber upgrades. There are many possible control strategies TCEQ could have considered, but it can only evaluate controls for which we have credible and defensible information to support. Additionally, the TCEQ is not aware if this information was even available at the companies in 2008 when this portion of the SIP was developed.

It is unreasonable for the EPA to disapprove a SIP submittal on the basis of the state failing to perform an analysis when only the EPA has the legal authority to require submission of the necessary information for such an analysis. The EPA should not hold the states to a standard for SIP approvability that only the EPA is capable of meeting.

G.6. The EPA's finding that the TCEQ should have considered scrubber upgrades in the 2009 RH SIP is arbitrary and capricious. While the EPA did comment on the TCEQ's proposed 2009 RH SIP, the EPA did not suggest in any way in those comments that the TCEQ should consider scrubber upgrades in the control strategy analysis for reasonable progress goals. The EPA is attempting to hold Texas to a standard created five years after the TCEQ submitted the 2009 RH SIP.

The EPA states in the proposed FIP that it was "unreasonable" for Texas to not perform an analysis of potential scrubber upgrades on coal-fired units in Texas that were already equipped with FGD scrubbers (79 FR 74841). However, in the comments (dated February 15, 2008) that the EPA submitted on the proposed 2009 RH SIP, the EPA did not suggest the TCEQ consider scrubber upgrades as a possible control strategy or indicate in any manner that not considering this potential measure would be grounds for the EPA proposed disapproval of the SIP. Furthermore, in the agency's comments (dated September 30, 2013) on the proposed 2014 Five-Year Texas RH SIP Revision, the EPA again did not mention the subject of FGD scrubber upgrades. The EPA had multiple opportunities to inform the TCEQ that considering FGD scrubber upgrades was as critical as the EPA now claims it to be; however, the EPA did not even mention the subject of scrubber upgrades in any of the formal comments it submitted to the TCEQ during the comment period for the 2009 RH SIP.

The EPA attempts to back-fill its lack of any notice to Texas regarding the consideration of FGD scrubber upgrades by citing statements made by the EPA in the 2005 final BART rulemaking recommending that states consider scrubber upgrades for BART analysis purposes (*Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal*

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Implementation Plan, page 26). However, the EPA's statements in the final BART rulemaking were made solely in the context of BART analysis (70 FR 39171). As Texas was included in the CAIR in 2008 and the EPA determined that CAIR was better than BART, the EPA's comments regarding scrubber upgrades and BART were not relevant to Texas. Furthermore, the EPA did not mention in the 2005 BART rulemaking that states should also consider scrubber upgrades for reasonable progress purposes even if the state's BART-eligible EGUs were subject to CAIR.

The EPA is attempting to hold Texas to a standard of SIP approvability arbitrarily created by the EPA five years after the TCEQ submitted the SIP revision. The EPA is creating impossible standards for SIP approvability by expecting states' SIP revisions to meet requirements created by the EPA after the states are required to submit the SIP revision.

H. BART Determinations

The TCEQ supports the EPA's intention to approve TCEQ's BART determination.

The EPA proposes to approve Texas' determination of which sources in the state are BART-eligible. The EPA also proposes to approve Texas' determination that none of the state's BART-eligible non-EGUs is subject to BART requirements because they are not reasonably anticipated to cause or contribute to visibility impairment in any Class I areas. The EPA proposes to approve the provisions in Texas' BART rules at 30 TAC Subchapter M, with the exception of 30 TAC §116.1510(d), which relies on CAIR.

I. Long-Term Strategy

1.1. The RHR does not require that a downwind state's RPG must be "approved or approvable" in order to determine if the upwind state's long-term strategy meets the statute or the rule. This is a new and illegal change to the RHR without going through notice and comment rulemaking as required by the Administrative Procedures Act and is thus an arbitrary and capricious determination by the EPA.

The EPA's proposed disapproval of the state consultation requirements is based upon Oklahoma's determination, subsequent to submittal of the Texas 2009 RH SIP, that it required further reductions from Texas. The EPA has not justified its determination that Texas failed to meet the requirements of FCAA, §51.308(d)(3)(i) and in fact the record shows that the process as laid out in the SIP and as required by the rule was followed by Texas. The EPA's determination is based on a new definition of progress goal in subsection (d)(3)(ii) and a misstatement of the actual rule itself in subparagraph (i).

Texas met the consultation requirements in §51.308(d)(3)(i). Texas determined where emissions were reasonably anticipated to contribute to visibility impairment in Oklahoma. Texas consulted with Oklahoma. The EPA asserts that the TCEQ should have provided information necessary to identify reasonable reductions, which is not required by the RHR. Oklahoma requested information on controls identified by CENRAP. Oklahoma had information on control upgrades contained in the proposed Texas 2009 RH SIP. Yet, it did not request additional controls on Texas sources or disagree with Texas' determination that additional controls were not warranted during the first planning period. It was only after consultation with Texas that Oklahoma argued that it needed controls that they did not have authority to require from Texas sources. Oklahoma's after-the-fact change in position and the EPA's subsequent proposed disapproval of their RPGs for Wichita Mountains does not provide the legal basis for proposed disapproval of Texas' long-term strategy consultations. The RHR does not require that a downwind state's RPG must be "approved or approvable" in order to determine if the upwind state's long-term strategy meets the statute or the rule. This is a new and illegal change to the RHR and is thus an arbitrary and capricious determination by the EPA.

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1.2. The EPA's finding that the TCEQ did not meet the long-term strategy consultation requirements of 40 CFR §51.308(d)(3)(i) and (ii) ignores the voluminous and detailed consultation record contained in the Texas 2009 RH SIP. The EPA holds Texas to a different standard of review than it has with other similar regional haze SIPs.

Section 51.308(d)(3) requires, (i) that Texas consult with other states if its emissions are reasonably anticipated to contribute to visibility impairment at that state's Class I areas(s), and (ii) if so, it must demonstrate that it has included in its SIP all measures necessary to obtain its share of emission reductions needed to meet the RPG for that Class I area.

As the EPA acknowledges, the TCEQ relied on CENRAP source apportionment modeling and its own supplemental analysis, available to all affected states, FLMS, and tribes, to evaluate and identify reasonable controls. The TCEQ did include additional controls or measures in its SIP, beyond those required to meet other programs, and every state in the consultation, including Oklahoma, concurred. For Wichita Mountains, additional controls were not deemed reasonable given that the CENRAP modeling – agreed to by all the states – showed that the visibility impairment contributions from Texas go down during the planning period (2002 – 2018). The EPA's preamble, and Table 26 acknowledge this.¹² Most importantly, Oklahoma did not request additional controls from Texas during consultation. The EPA ignores the record and proposes to hold the Texas plan to a standard that is not found in the RHR. The EPA merely disagrees with the TCEQ's conclusions and attempts to apply a 'reasonableness' standard to §51.308(d)(3)(ii) where none exists. That section only requires that the TCEQ demonstrate that all controls necessary to meet the progress goal, for Wichita Mountains, are included. Oklahoma agreed that no additional controls were needed at the time, and the evidence that the contribution to visibility improvement from emission reductions at Texas sources during the planning period is a sufficient basis for these conclusions.

The EPA has viewed similar consultations in other state SIPs, using the same CENRAP information, as meeting the RHR requirements for long-term strategy consultations. A case in point is Arkansas's regional haze plan. The CENRAP modeling that the EPA now finds lacking for Texas and Oklahoma's consultation was perfectly fine for Arkansas. It demonstrated that visibility impairment from Arkansas sources at Hercules Glades in Missouri was projected to increase during 2002-2018. In consultations with Missouri, Arkansas made no commitment for additional controls beyond those already factored into CENRAP's modeling for 2018. All states agreed with this determination, including Missouri. Yet, with no further explanation, the EPA approved Arkansas' consultation and its determination that no additional controls were necessary, as consistent with the RHR, even though the data that was clearly available to everyone showed impairment at Hercules Glades due to Arkansas' sources would increase (76 FR 64186, 64216).

1.3. The TCEQ disagrees with the EPA's position that Texas did not adequately address the documentation requirements in 40 CFR §51.308(d)(3)(iii) regarding the technical basis for Texas' long-term strategy.

The proposal quotes the RHR:

The State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. The State

¹² "The contributions from Texas sources on total visibility impairment decreases from 2002 to 2018 at all impacted Class I areas shown in the tables below." 79 FR page 74860.

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may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants (79 FR 74861).

Texas documented the modeling, the monitoring, and emissions information data used for the 2009 RH SIP. The modeling was completed by CENRAP and available for all states. The monitoring data were available from the IMPROVE monitors and the emissions data had been previously approved by the EPA. The preamble contains a lengthy discussion – over eight *Federal Register* pages, plus the Technical Support Document – of Texas' consultation with Oklahoma, Colorado, Arkansas, and New Mexico, the CENRAP process and modeling and the TCEQ's supplemental analysis of CENRAP's technical analysis. This discussion belies the EPA's claim that the TCEQ did not adequately meet the requirements in 40 CFR §51.308(d)(3)(iii) to document the technical basis for the TCEQ's apportionment determination. The EPA and Oklahoma cannot fairly argue that not all relevant data was available to inform them of Texas source's visibility impact on neighboring Class I areas and the reasoned analysis that additional controls would not be necessary to reduce visibility impairment outside Texas.

1.4. The TCEQ's analysis of potential additional controls is adequate and approvable. The EPA's proposed finding that a specific type of unit-by-unit cost and effectiveness analysis was necessary to have an approvable long-term strategy and an approvable consultation with Oklahoma contradicts the EPA's own June 1, 2007 Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program. The EPA's methodology of evaluating possible additional controls on existing EGUs is not required by the RHR or by the guidance in place at the time Texas prepared its 2009 RH SIP.

The EPA's own guidance, Chapter 4: Identify Control Measures for Contributing Source Categories for the First Planning Period, page 4-2, states:

The Regional Haze Rule gives States wide latitude to determine additional control requirements, and there are many ways to approach identifying additional control measures; however, you must at a minimum, consider the four statutory factors.

The TCEQ prepared its analysis of the cost and effectiveness of additional controls by selecting sources and controls that met a \$2,700 per ton threshold. This threshold amount was used in CAIR, as well as used by the EPA in preparing its BART rules and guidance.

The control package Texas considered included SO₂ controls at 24 facilities from 15 sites. The NO_x controls included 24 facilities at 15 sites. The calculated haze index improvements at affected Class I areas from the additional controls ranged from a low of 0.04 deciview at Wheeler Peak in New Mexico to 0.36 deciview at Wichita Mountains in Oklahoma. The estimated annualized cost for the controls necessary to achieve these calculated benefits was \$324 million. Texas determined that this cost is unreasonable for a visibility improvement that is below the threshold of perception and below the 0.5 deciview criteria the EPA used for "contribute to."

Also on page 4-2, the guidance refers to the EPA's AirControlNET database as a source of \$324 million a year. In its analysis, Texas relied on the cost and effectiveness information supplied by AirControlNET regarding control techniques for specific source categories. In preparing the 2009 RH SIP, Texas did use appropriate areas of influence; it did consider controls from the EPA's AirControlNET database; and it did consider the four statutory factors in considering whether additional controls were reasonable to implement.

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The EPA's preference for a different analysis procedure that reaches a similar conclusion about cost and effectiveness is not a justifiable basis for the EPA to disapprove Texas' process in developing its 2009 RH SIP submittal nor is it a justifiable basis for the EPA to disapprove the Texas-Oklahoma consultation about Texas' impact on visibility impairment at Wichita Mountains.

J. Response to Proposed FIP Requirements

J.1. The EPA's proposed FIP is contrary to authority provided in the FCAA. The statute provides the EPA with authority to address state plans that it believes are substantially inadequate to comply with the Act's requirements. The EPA RHR identifies periodic reviews and plan updates as the remedy for addressing RH SIPs that are inadequate.

In order to promulgate a FIP, the FCAA requires that the EPA disapprove a state plan in whole or in part for not meeting the applicable requirements of §110(k). Texas' plan was complete by operation of law and met all requirements. The EPA has no authority to impose a FIP that merely replaces the EPA's judgment for Texas' but does not correct an error or is not based on a failure of Texas' plan to meet the requirements of the RHR or FCAA.¹³

The EPA's RHR established the remedy for a substantially inadequate plan as periodic updates, not a federal plan.¹⁴ The nature of regional haze and the statutory requirement for reasonable progress and *long-term* solutions to visibility impairment require regular updates and reviews of state plans by the states themselves. Thus, the very nature of regional haze planning recognizes that the solution to plans that don't make adequate progress towards the natural visibility condition goal is an update of the plan, not a FIP.

J.2. The FCAA gives states authority to develop regional haze plans that reflect state needs. The EPA should not get deference for its own choices in its FIP over those of Texas.

The EPA's interpretation of its authority to review regional haze submissions under FCAA, §169A is flawed. While the EPA review and state revision of regional haze SIPs is a component of §110, the FCAA also provides an independent grant of authority to states, and specific language identifying the EPA authority to establish goals and guidance for regional haze. The use of the word "guideline" in the in §169A evidences a clear congressional intent that states be granted wide latitude in decision-making here. FCAA, §169A inherently limits the EPA's SIP approval and review authority in §110.

The EPA's only complaint regarding the 2009 Texas SIP is that it would have taken a different approach to meet the statutory and regulatory requirements. The EPA's suggested reliance on the NCII default values in estimating natural visibility conditions at Big Bend and Guadalupe Mountains rather than the FLM's 80% approach was not adequately justified and therefore is unreasonable.

The statute requires that in developing the RPG, the regulating entity must consider "the energy and non-air quality environmental impacts of compliance." Nowhere in the EPA's proposal is this factor further defined. The EPA provides guidance to states on how to consider this factor,

¹³ See Train, 421 U.S. 60, 79 "The CAA gives the [EPA] no authority to question the wisdom of a State's choice of emission limitations if such choices are part of a plan which satisfies the standards of 110(a)(2)."

¹⁴ See 64 FR 35745: "...section 110(a)(2)(F) of the CAA provides that SIPs are to require 'periodic reports on the nature and amounts of emissions and emissions-related data' and 'correlation of such reports....with any emission limitations or standards establish pursuant to this chapter.' Moreover, section 110(a)(2)(H) requires SIPs to provide for revision when found to be substantially inadequate to 'comply with any additional requirements established under...[the CAA].'"

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but ignores a crucial part of the term. The EPA cites only one element of its BART guidance as the basis of its analysis of this factor, but ignores another more important element: the impact to energy reliability and costs due to compliance with the RPG controls in the proposed FIP that are developed for a large segment of the electric energy production in Texas.

J.3. The EPA's cost analysis for the proposed FIP is not adequate, in particular regarding the FGD scrubber upgrades. The EPA cannot use the claim of confidential business information to circumvent its obligation to provide the public with adequate information regarding the economic analysis of its regulatory actions or to defend its decision to disapprove the Texas 2009 RH SIP.

The EPA cites the companies' claims of confidential business information to defend its complete lack of any cost information regarding upgrades to scrubbers and merely claims that all the scrubber upgrades were less than \$600 per ton (79 FR 74877). Confidential business information is not a justification for failing to provide proper cost impact information of a proposed rule. The EPA could have provided example cost information for each type of scrubber upgrade considered without disclosing any specific information claimed confidential by the companies. The EPA has not even provided a total cost for all the scrubber upgrades. Additionally, while the proposal preamble and *Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan* include detailed information on the costs of the scrubber retrofits, the EPA also did not provide a total cost estimate of the seven EGUs that EPA has proposed standards that would require installation of new FGD scrubbers. The only total cost estimate provided by the EPA for the proposed FIP is the approximate \$2 billion provided by EPA staff in informal discussions with the TCEQ.

The EPA claims the TCEQ should have considered scrubber upgrades as a cost-effective control measure in the Texas 2009 RH SIP revision. Yet, even with the proposed FIP, the EPA has not provided the TCEQ or the public with any information to evaluate the cost-effectiveness of scrubber upgrades. Neither the TCEQ nor the public is required to accept the EPA's unsubstantiated claim that the cost-effectiveness of the scrubber upgrades is less than \$600 per ton. The EPA is using the cost-effectiveness of scrubber upgrades as a basis for disapproving the Texas 2009 RH SIP and must provide adequate information for evaluating the basis of the EPA's decision. The EPA should provide cost information for all scrubber upgrade methodologies considered by the agency.

J.4. The TCEQ disagrees with the EPA proposal to calculate visibility impairment, (i.e., baseline visibility conditions minus natural visibility conditions) using the EPA's proposed substitute natural visibility conditions for Big Bend and Guadalupe Mountains instead of the natural visibility conditions calculated by Texas for its two Class I areas.

The EPA should accept Texas' calculation of natural visibility conditions at Big Bend and Guadalupe Mountains. These calculations followed the requirements of 40 CFR §51.308(d)(2)(iii) using data and analyses specific to each of the Class I areas. The EPA's proposed substitute estimates of natural conditions were developed by a committee working on national estimates rather than using site specific scientific studies. The EPA did use the correct Baseline Visibility Conditions, 2000-2004, in Table 40.

J.5. The TCEQ supports the EPA's proposal to find that it is not reasonable to provide for rates of progress at Wichita Mountains, Big Bend, or Guadalupe Mountains that would attain natural visibility conditions by 2064 and to use the baseline conditions calculated by Texas in establishing the URP at Big Bend and Guadalupe Mountains.

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Once technically supportable natural conditions estimates are selected for these two Class I areas, the URP can be established for them. However, as discussed in comment C.1., the TCEQ disagrees with the EPA's proposal regarding the natural conditions estimates.

J.6. The TCEQ urges the EPA to remove all text about benefits of emission reductions from "actual emission levels" from its final action and technical support documents. These discussions exaggerate the potential benefits of the EPA's proposed FIP and are irrelevant to the approvability of the 2009 RH SIP.

Both Table 44: *Calculated RPGs for 20% Worst Days...* and Table 45: *Anticipated Visibility Benefit...* should be removed from the final action because they tabulate calculated benefits that will not occur by 2018, the only year that is appropriate for evaluating the visibility impacts of proposed controls. The 2018 visibility conditions that the 2009 RH SIP will produce are the appropriate starting points for evaluating the effects of the EPA's proposed FIP.

The EPA inappropriately suggests in its proposal and technical support documents that emission rates in 2011, 2012, or 2013 are relevant to what the Texas 2009 RH SIP will achieve by 2018. The RHR sets 2018, the last year in the first planning period, as the time by which a state's SIP must provide for reaching the state's RPG. The RHR does not imply the need for particular emission levels during any intermediate year between the baseline period and 2018.

There is no technical basis for the EPA's selection of actual emissions from 2009 through 2013 as the base from which to calculate the benefit of applying the FIP controls. During the 2009 through 2013 period, the emissions were not affected by the full range of additional emission reduction requirements contained in the 2009 RH SIP.

Choosing 2011 ignores seven more years of emissions reductions required under Texas' long-term strategy. As Texas' 2014 Five-Year RH SIP submittal shows in Figure 4-1: *Texas Modeled Emissions Inventory Summary for 2002* and Figure 4-2: *Updated Texas Emissions Inventory Summary for 2005*, the SO₂ and NO_x emissions in Texas are already lower than the straight line between the 2000 through 2004 baseline condition period and the 2018 SO₂ and NO_x emissions estimates used to develop the 2009 RH SIP.⁴⁵

Table 45 misleads a reader to believe that the EPA's proposed FIP action would produce a 0.62 deciview improvement in visibility at Wichita Mountains. However, as discussed in comment A.2., the potential 0.14 deciview improvement at Wichita Mountains is almost certainly an overstatement of the incremental benefit from the proposed FIP in 2018 because SO₂ emission reductions are occurring due to other requirements and the actual SO₂ emissions will likely be lower than those in the CENRAP 2018 emissions projections.

K. Proposed Disapproval of the Infrastructure SIPs

The TCEQ disagrees with the EPA's proposed disapproval of §110(a)(2)(D)(i) requirement for visibility protection for the Texas infrastructure SIP submittals for ozone, particulate matter (PM_{2.5}), nitrogen dioxide (NO₂), and SO₂ NAAQS. The EPA fails to go into any detail on the reasons for disapproving these multiple, separate SIPs.

For the 1997 eight-hour ozone standard, the EPA only states that Texas originally failed to make a timely submission, and notes that CAIR was then promulgated and implemented by the EPA. Texas was not in CAIR for ozone, and subsequently submitted a separate transport SIP for the 1997 eight-hour ozone NAAQS. The EPA neglects to offer any reason or explanation for why this submission was inadequate or deserving of disapproval, other than the promulgation and implementation of the CSAPR. Although Texas was included in CSAPR for the 1997 eight-hour

⁴⁵ See https://www.tceq.texas.gov/assets/public/implementation/air/sip/haze/13012SIP_ado.pdf.

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ozone standard, Texas has from the beginning challenged that inclusion, and litigation over the matter is on-going. Additionally, the EPA failed to act on, or even mention the Texas ozone transport SIP submission before including Texas in CSAPR for the 1997 ozone standard.

For the 1997 PM_{2.5} NAAQS, Texas was included in CAIR, and subsequently complied with CAIR requirements. The EPA included Texas in CSAPR for the 1997 PM_{2.5} NAAQS at final promulgation of the rule, without having given Texas proper notice of this inclusion by including Texas in the proposed rule. Texas has challenged its inclusion in CSAPR for the 1997 PM_{2.5} NAAQS, and litigation over this matter is also on-going. The linkage of Texas to a single monitor in an area already attaining the relevant NAAQS is a clear case of over-control, something explicitly prohibited by the FCAA, as acknowledged by the Supreme Court.¹⁶ Texas also submitted a transport SIP for the 2006 PM_{2.5} NAAQS. Although this SIP did rely on CAIR, the EPA has failed to offer any substantive reason why this is inappropriate, given that CSAPR replaced CAIR, and the sole Texas linkage in the final CSAPR for 2006 PM_{2.5} are to the same inappropriate monitor in an area already attaining the NAAQS.

As for the 2008 ozone, 2010 SO₂, and 2010 NO₂ standards, Texas has submitted transport SIPs for each of these standards demonstrating that Texas does not have transported emissions out of state that interfere with attainment or maintenance in any downwind state.

The EPA fails to offer any rational or reasoned explanation for why these SIP submissions are inadequate. In fact, the EPA fails to offer any analysis of these SIP submissions at all; therefore, this proposed disapproval is arbitrary, capricious, and not supportable. Finally, the EPA states that because it is proposing the need for additional SO₂ controls on Texas sources to prevent interference with measures required to be included in the Oklahoma Regional Haze SIP to protect visibility, the EPA must therefore disapprove the §110(a)(2)(D)(i) submittals for 1997 PM_{2.5}, 2006 PM_{2.5}, and 2010 SO₂ NAAQS. The EPA fails to offer any support for this contention, or the inclusion of the PM_{2.5} standards in this list. The EPA has repeatedly stated that infrastructure requirements, including transport requirements, are pollutant specific. Therefore, a requirement to increase SO₂ controls does not, without further explanation, necessarily include the requirements for PM_{2.5}. Although the EPA has taken other actions in conflict with its guidance on this issue, there is no rational reason to continue to perpetuate this error.

L. Nationwide Scope and Effect

The TCEQ disagrees with the EPA's assertion that this action is a rulemaking of nationwide scope and effect. Any appeal of the EPA's final action on Texas' regional haze plan and FIP should be filed the 5th Circuit Court of Appeals.

The EPA argues that the proposed FIP and SIP disapproval actions for Texas and Oklahoma have nationwide scope and effect and therefore, under FCAA, §307(b)(1), appeal must be to the D.C. Circuit. First, the TCEQ notes that the EPA has in fact taken the opposite position in several final actions on regional haze plans in Oklahoma, New Mexico and Arizona.¹⁷

These EPA actions do not have nationwide scope and effect; they are not nationally applicable, but apply only to two states. The EPA has provided no legal basis - beyond a one sentence assertion - to support that its actions interpreting the RHR as they apply to Texas and Oklahoma are of "nationwide scope and effect." This interpretation of the RHR as it applies to Texas and Oklahoma Regional Haze SIPs is unsupported by the EPA's proposed action. The action here specifically deals with plans adopted by Texas and Oklahoma to meet the FCAA and regional haze regulations as they apply in their respective jurisdictions. Each regional haze plan

¹⁶ See *E.P.A. v. EME Homer City Generation, L.P.*, 134 S.Ct. 1584, at 1608 (April 29, 2014).

¹⁷ See for example: 79 FR 12944, 12954 March 7, 2014; 77 FR 70693, 70705, Nov. 27, 2012; 78 FR 46142, 46174 July 13, 2013; 79 FR 52420, 52479, Sept. 3, 2014.

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submitted by the various states is unique, addressing visibility impairment at Class I areas in those states and in surrounding states. The EPA's proposed partial disapproval of Texas' plan and proposed imposition of a FIP does not rely solely on an interpretation of their rules but rather on a review of the Texas plan's comportment with those rules. The EPA has proposed determinations that Texas did not develop its natural visibility conditions and RPG correctly. The EPA then goes on to draft RPG controls for 15 Texas units and redo the natural visibility estimates. This proposal is *Texas-centric*; it is not nationally applied.

The EPA then attempts to plug the obvious hole in its position by pointing to congressional report language that allows the Administrator to determine its action has nationwide scope and effect if the rulemaking extends to two judicial districts. This is not found in the FCAA. In fact, §307(b)(1) specifically states that "any implementation plan" or "any other final action of the Administrator under this chapter...which is locally or regionally applicable may be filed only in the United States Court of Appeals for the appropriate circuit." The fact that Oklahoma is in the Tenth Circuit and Texas is in the Fifth Circuit is immaterial to potential petitions for review. The TCEQ's comments and any future actions it may or may not take in court will be based on the EPA's action on Texas' SIP and any FIP the EPA has imposed on Texas, not Oklahoma. As stated previously, venue for regional haze plans in several neighboring states, including Oklahoma, is already established in their respective circuits.

M. Electric Reliability

M.1. The EPA should consider the findings of the Electric Reliability Council of Texas (ERCOT) report *Impacts of Environmental Regulations in the ERCOT Region*.

The EPA has not evaluated any potential impacts of the proposed FIP to reliability and prices of electricity in Texas, as further discussed below. In 2014, ERCOT conducted a study of the impacts that environmental regulations have in the ERCOT Region. The report, entitled *Impacts of Environmental Regulations in the ERCOT Region*, was finalized on December 16, 2014, and is included as Appendix 1 to the TCEQ's comments. While the report included a number of environmental regulations, such as the MATS rule, Clean Power Plan, and CSAPR, ERCOT also included the EPA's proposed Regional Haze FIP for Texas in its analysis. The TCEQ incorporates the ERCOT report into the agency's comments and encourages the EPA to consider the findings of the ERCOT report.

M.2. The EPA is using a loophole in Executive Order 12866 to avoid evaluating the potential energy impacts of the proposed action as required by Executive Order 13211. The proposed FIP affects a significant portion of Texas' base load power generation fleet and the EPA should evaluate and consider the impacts of the proposed FIP on the reliability and price of electricity in Texas.

The EPA claims that the proposed FIP is not subject to Executive Order 12866, regarding Regulatory Planning and Review, because the proposed rule is not a rule of general applicability and therefore, is not a significant regulatory action (79 FR 74889). If the proposed FIP is not a significant regulatory action under Executive Order 12866, then the EPA indicates the rule is not subject Executive Order 13211, regarding actions that significantly affect energy supply, distribution, or use (79 FR 74890). However, while the EPA claims that the rule is not of general applicability to avoid triggering the requirements of Executive Orders 12866 and 13211, the EPA also claims that the rule is of nationwide scope and effect in an effort to have any petitions for review be filed in the United States Court of Appeals for the District of Columbia (79 FR 74888). The EPA claims the rule is of national scope for purposes of legal challenges, but then claims the rule is of limited scope for the purposes of avoiding Executive Orders 12866 and 13211 without any explanation of how this action can have two contradictory scopes. The scope of the

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regulatory action proposed by the EPA is either nationwide or limited to Texas; it cannot be both.

As discussed in TCEQ comment II. L, the TCEQ disagrees with the EPA's position that the proposed action is of nationwide scope (79 FR 74888). However, the TCEQ also disagrees with the EPA position that the potential impact to the supply, distribution, and use of energy does not need to be considered in this proposed action. While the EPA has not provided a complete economic impact analysis for the proposed FIP, the annualized cost for the scrubber retrofits portion of the proposal is estimated to be approximately \$238 million per year, greatly exceeding the \$100 million per year threshold established under Executive Order 12866. Furthermore, the EPA's proposed FIP would meet Executive Order 13211 criteria for being "likely to have a significant adverse effect on the supply, distribution, or use of energy" based on the guidance provided in Office of Management and Budget (OMB) Memoranda 01-27, July 13, 2001 Guidance for Implementing Executive Order 13211. Section 4 of the OMB Memoranda 01-27 provides a number of examples of adverse effects for the purpose of Executive Order 13211. One of the listed examples is a reduction in electricity production in excess of 1 billion kilowatt-hours or in excess of 500 megawatts (MW) of installed capacity. According to a recent ERCOT report included in Appendix 1 to the TCEQ's comments, ERCOT's modeling indicates that approximately 1,800 MW of capacity from the affected coal-fired EGUs are expected to retire due to the EPA's proposed Regional Haze FIP requirements, exceeding the threshold in the OMB guidance for an adverse effect.¹⁸ Also, with the exception of the San Miguel facility, each of the units subject to the EPA's proposed FIP is greater than 500 MW. If just one of these units is no longer economically viable as a result of the EPA's FIP, it would result in the reduction of more than 500 MW of installed capacity.

According to OMB Memoranda 01-27, the basic purpose of Executive Order 13211 is to ensure that agencies "appropriately weigh and consider the effects of the Federal Government's regulations on the supply, distribution, and use of energy." The EPA's interpretation of Executive Orders 12866 and 13211 would mean that a national rule applying to all coal-fired EGUs in the country with an annualized cost of \$100 million per year that might result in the loss of only 500 MW of a capacity would require an energy impact analysis because it may have a significant adverse effect on the supply, distribution, or use of energy. However, according to the EPA's interpretation, a rule costing more than twice that cost threshold and potentially resulting in the loss of more the three times the capacity but focused within a discrete electric reliability region in a single state that has limited connections to the rest of the United States' grid does not require any analysis or consideration of the possible adverse impacts on energy. In other words, the EPA's position is that the Federal Government does not need to concern itself with a potentially severe impact of this proposed rule on the supply, distribution, or use of energy within ERCOT because the impact is limited to a single state. Such an interpretation and outcome is illogical and clearly contrary to the stated intent of Executive Order 13211. The potentially for adverse effects from the EPA's proposed rule is actually increased, not lessened, because the costs and impacts of the rule are focused within a smaller region.

Additionally, FCAA, §169A(g) requires that the State and the Administrator consider the energy and non-air quality environmental impacts of compliance when determining the best available retrofit technology. While the EPA's guidance on evaluating energy impacts for BART analyses does not specifically address considering electrical grid reliability and electricity prices, the guidance does make allowance for considering indirect energy impacts as well as potential impacts such as locally scarce fuels and significant economic disruption or unemployment (70 FR 39169). Furthermore, the EPA recommends that states consider the BART guidelines when

¹⁸ See ERCOT Report Impacts of Environmental Regulations in the ERCOT Region, December 16, 2014, page 27.

COMMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
DOCKET ID NO. EPA-R06-OAR-2014-0754

evaluating the energy and non-air environmental impacts for reasonable progress goal purposes.¹⁹

The proposed action affects almost 10,000 MW of generation capacity in Texas and almost 8,800 MW of that capacity is within the ERCOT region. The affected units in ERCOT represent approximately 11% of region's 2015 total capacity based on ERCOT's *Report on Capacity, Demand, and Reserves for the ERCOT Region, 2015 – 2024*.²⁰ Based on the significant portion of the Texas electrical grid affected by the EPA proposal and the projected retirements estimated by ERCOT to result from this action, the EPA should analyze and consider the possible impacts of the proposed rule on the reliability and prices of electricity in Texas, regardless of the applicability of Executive Orders 12866 and 13211.

M.3. The TCEQ recommends that the EPA withdraw the proposed FIP; however, if the EPA does finalize the FIP, the EPA should include an electric reliability safety valve provision in the final rule.

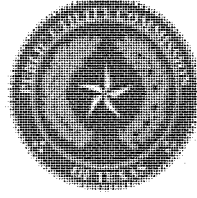
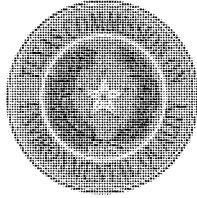
As discussed in comments sections A, J, and K, the TCEQ maintains that its 2009 RH SIP is approvable as submitted and the EPA should withdraw the proposed FIP. However, if the EPA does finalize the FIP then the final rule should include a reliability safety valve provision. The EPA has not considered the potential electric reliability implications of the proposed rule. A reliability safety valve provision in the rule could be a provision that allows the EPA to grant an extension to the compliance dates in situations where electric reliability is at risk, after consultation with the appropriate Independent System Operator/Regional Transmission Organization.

¹⁹ See Guidance for Setting Reasonable Progress Goals under the Regional Haze Program, June 1, 2007, page 5-3; 79 FR 74874.

²⁰ See <http://www.ercot.com/gridinfo/resource>; December 1, 2014.

COMMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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Appendix 1: Impacts of Environmental Regulations in the ERCOT Region



April 20, 2015

Guy Donaldson, Chief
Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue Suite 1200
Dallas, Texas 75202-2733

Re: Docket ID Number EPA-R06-OAR-2014-0754

Dear Mr. Donaldson,

The Public Utility Commission of Texas (PUCT) and the Texas Commission on Environmental Quality (TCEQ) appreciate the opportunity to comment on the proposed rule to partially approve and partially disapprove a revision to the Texas State Implementation Plan (SIP) that addresses regional haze and the corresponding Federal Implementation Plan (FIP) for Texas. These actions were published in the *Federal Register* on December 16, 2014 (79 FR 74818).

Detailed comments on the proposed SIP disapproval and FIP are enclosed.

If you have questions concerning TCEQ's comments on the proposed rule, please contact Mr. Steve Hagle, P.E., at (512) 239-1295 or by e-mail at steve.hagle@tceq.texas.gov. If you have questions concerning the PUCT's comments, please contact Mr. Tom Hunter at (512) 936-7280 or by e-mail at tom.hunter@puc.texas.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard A. Hyde".

Richard A. Hyde, P.E.
Executive Director
TCEQ

A handwritten signature in black ink, appearing to read "Brian H. Lloyd".

Brian H. Lloyd
Executive Director
PUCT

Enclosure

**COMMENTS OF THE UTILITY AIR REGULATORY GROUP ON THE
U.S. ENVIRONMENTAL PROTECTION AGENCY'S PROPOSED RULE:
APPROVAL AND PROMULGATION OF IMPLEMENTATION PLANS; TEXAS AND OKLAHOMA;
REGIONAL HAZE STATE IMPLEMENTATION PLANS; INTERSTATE TRANSPORT STATE
IMPLEMENTATION PLAN TO ADDRESS POLLUTION AFFECTING VISIBILITY AND REGIONAL
HAZE; FEDERAL IMPLEMENTATION PLAN FOR REGIONAL HAZE AND INTERSTATE TRANSPORT
OF POLLUTION AFFECTING VISIBILITY**

79 Fed. Reg. 74,818 (Dec. 16, 2014); Docket No. EPA-R06-OAR-2014-0754

April 20, 2015

On December 16, 2014, the U.S. Environmental Protection Agency ("EPA" or "Agency") published in the Federal Register a proposed rule under the Clean Air Act ("CAA" or "Act") addressing regional haze requirements for the states of Texas and Oklahoma, entitled "Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan To Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility." 79 Fed. Reg. 74,818 ("proposed rule"). This proposed rule would partially approve and partially disapprove a revision to the Texas state implementation plan ("SIP") addressing regional haze for the first planning period of that program. The partial approval for Texas applies to a number of the SIP's provisions, including many of the SIP's "best available retrofit technology" ("BART") requirements. The partial disapproval applies to the SIP's long-term strategy ("LTS") for Texas and the reasonable progress goals ("RPGs") for two Class I areas in Texas, Big Bend National Park ("Big Bend") and Guadalupe Mountains National Park ("Guadalupe"). The partial disapproval also applies to Texas's interstate transport SIP for the 1997 and 2006 fine particulate matter ("PM_{2.5}") national ambient air quality standards ("NAAQS"), the 1997 and 2008 ozone NAAQS, the 2010 nitrogen dioxide ("NO₂") NAAQS, and the 2010 sulfur dioxide ("SO₂") NAAQS. In addition, EPA

proposes to disapprove the RPG for a Class I area in Oklahoma, Wichita Mountains National Wildlife Refuge (“Wichita Mountains”).

EPA proposes federal implementation plan (“FIP”) provisions in place of the Texas and Oklahoma SIP provisions that it proposes to disapprove. The proposed FIP for Texas would impose SO₂ emission limits on 15 electric generating units (“EGUs”) in Texas as part of the LTS for that state under the CAA’s “reasonable progress” provisions. It would establish new RPGs for Big Bend and Guadalupe. It would also substitute Texas’s reliance on the Clean Air Interstate Rule (“CAIR”) to satisfy BART requirements at its EGUs with reliance on CAIR’s successor, the Cross-State Air Pollution Rule (“CSAPR”). The proposed FIP for Oklahoma would establish a new RPG for Wichita Mountains based on the additional emission reductions that EPA’s FIP for Texas would require.

EPA’s proposed rule raises significant issues and would depart from the Agency’s past practice, the requirements of the CAA and EPA’s regional haze rule, and EPA’s guidance on reasonable progress. The Utility Air Regulatory Group (“UARG”)¹ submits the following comments and urges EPA to withdraw the elements of its proposed rule that would disapprove parts of the Texas and Oklahoma regional haze SIPs and that would promulgate FIP provisions in their place.

I. Legal and Factual Background

The CAA’s visibility protection provisions establish as a national goal “the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory class I Federal areas which impairment results from manmade air pollution.” CAA § 169A(a)(1). The

¹ UARG is an ad hoc, not-for-profit, unincorporated group of individual electric utility companies, other electric generators, and industry trade associations. UARG participates on behalf of its members in proceedings arising under the CAA that may affect its members.

Act directs EPA to issue regulations designed “to assure ... reasonable progress toward meeting the national goal” and to require each state to submit a SIP containing “such emission limits, schedules of compliance and other measures as may be necessary to make reasonable progress toward meeting the national goal.” *Id.* § 169A(a)(4), (b)(2). A regional haze SIP has three main elements: (1) RPGs, which are visibility goals for each mandatory Class I federal area located in the state; (2) an LTS, which is the state’s plan for meeting the RPGs; and (3) BART requirements for certain large stationary sources.

EPA’s regional haze rule states that for each Class I area in a state, the state “must establish goals (expressed in deciviews) that provide for reasonable progress towards achieving natural visibility conditions.” 40 C.F.R. § 51.308(d)(1). The rules further require that an RPG “provide for an improvement in visibility for the most impaired days over the period of the implementation plan and ensure no degradation in visibility for the least impaired days over the same period.” *Id.* To establish an RPG, a state must conduct an assessment of four factors: “[1] the costs of compliance, [2] the time necessary for compliance, [3] the energy and non-air quality environmental impacts of compliance, and [4] the remaining useful life of any potentially affected sources.” *Id.* § 51.308(d)(1)(i)(A). The rules further require states to “include a demonstration showing how these factors were taken into consideration in selecting the goal.” *Id.* In addition, in setting RPGs, states must determine and take into account what EPA refers to as the uniform rate of progress (“URP”) that would be needed to attain natural visibility conditions by the year 2064. *Id.* § 51.308(d)(1)(i)(B). A state may establish an RPG that differs from the URP if the state demonstrates that the URP for the Class I area in question would not be reasonable. *Id.* § 51.308(d)(1)(ii). A state makes such a showing by conducting a reasonable progress analysis that considers the four reasonable progress factors. *Id.* Finally, states whose

emissions may cause visibility impairment in another state's Class I area and states with Class I areas that may experience visibility impairment caused by emissions from other states may be subject to an interstate-consultation requirement. *Id.* § 51.308(d)(1)(iv). The purpose of that requirement is to provide a forum for states to decide collaboratively on reasonable emission reductions and appropriate apportionment of responsibility for reducing emissions during each planning period of the regional haze program.

EPA's rules also direct each state to submit an LTS to address regional haze in its Class I areas and the Class I areas in other states that are affected by emissions from the state. *Id.* § 51.308(d)(3). The LTS "must include enforceable emissions limitations, compliance schedules, and other measures as necessary to achieve the reasonable progress goals established by States having mandatory Class I Federal areas." *Id.* As in the setting of RPGs, states must consult with one another when emissions from one state impact Class I areas in other states, and a state that causes or contributes to visibility impairment in a Class I area in another state must "demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area." *Id.* § 51.308(d)(3)(ii).

Finally, the regional haze rule specifies requirements for BART. States determine and require BART for "BART-eligible" sources that are "subject to BART" for the purpose of controlling emissions that impair visibility in Class I areas. Determining BART for a specific eligible source generally requires consideration of five factors as they apply to that source. CAA § 169A(g)(2); *see also* 40 C.F.R. § 51.301 (definition of BART). EPA's BART rules also permit states, instead of requiring a source to install, operate, and maintain BART, to establish a "BART alternative" that would "achieve greater reasonable progress than would be achieved through the

installation and operation of BART.” *Id.* § 51.308(e)(2). In separate rulemakings, EPA determined that compliance with interstate emission allowance trading programs for SO₂ and NO_x – specifically, the CAIR and CSAPR interstate trading programs – can satisfy EGUs’ BART obligations with respect to those pollutants. Under EPA’s proposed FIP for Texas, Texas’s participation in CSAPR would satisfy the state’s EGU BART compliance obligations for SO₂ and NO_x.

II. EPA’s “Guidance” on Interstate Consultation Is Procedurally Flawed and Inconsistent with the Regional Haze Rule.

EPA acknowledges that Oklahoma and Texas engaged in the interstate consultation process required by EPA’s regional haze rule and that Oklahoma did not request any additional emission reductions from Texas. 79 Fed. Reg. at 74,822-23. EPA suggests, however, that Oklahoma did not understand its right under the regional haze program to seek more emission reductions from Texas or that it failed to properly exercise that right. *Id.* at 74,872. EPA proposes to conclude that it must step in and force the Texas emission reductions that it believes Oklahoma should have requested. *Id.* For the reasons described below, EPA has no basis for doing so. EPA further concludes that because, in its view, Oklahoma did not understand the regional haze program’s consultation process, new nationally applicable guidance on interstate consultation, and on how those requirements apply in the “visibility transport” context, is needed. *Id.* at 74,823. EPA’s proposed “guidance” on this issue is irretrievably flawed and should be withdrawn.

As an initial matter, EPA purports to provide nationally applicable guidance with respect to visibility transport and interstate consultation but fails to provide legally adequate notice that this rulemaking addresses issues relevant to any state other than Texas and Oklahoma. *See id.* at 74,828-30 (EPA’s interpretation of 40 C.F.R. § 51.308(d)(1) and (d)(3)); *id.* at 74,888 (proposed

determination of nationwide scope and effect). The title of the proposed rule does not refer to nationally applicable guidance, and there is no reason to believe that the general public, including other states, have been apprised that this proposed rule includes significant new interpretations of EPA rules that are intended to govern the future implementation of the regional haze program outside of Texas and Oklahoma. For that reason, EPA's proposed rule is procedurally flawed and the proposed nationally applicable visibility transport guidance should be withdrawn.

The guidance EPA proposes is, moreover, inconsistent with EPA's regional haze rule and the Agency's existing guidance on interstate consultation. EPA begins its discussion of its new "interpretation" of 40 C.F.R. § 51.308(d)(1) and (d)(3) by stating that its regulations

do not explicitly address situations where the control measures in an upwind state's long-term strategy are sufficient to obtain its share of reductions needed to meet a RPG included in a downwind state's SIP, but the goal itself is flawed precisely because the upwind state never proposed sufficient control measures to ensure reasonable progress in the first place.

Id. at 74,829. In such a circumstance, EPA proposes to conclude that it must "disapprove both the downwind state's goal and the upwind state's long-term strategy." *Id.* But EPA's proposed action proceeds from a false premise. The regional haze rule does not specifically address this situation because that rule is designed in such a way that these circumstances will not arise.

Under the rule, states are empowered to establish RPGs and are generally required to do so based on an analysis of the four reasonable progress factors. So long as states undertake that analysis, EPA cannot engage in second-guessing and substitute its own RPGs for those adopted by a state. EPA's novel proposed guidance would eviscerate the state discretion provided under the regional haze rule to establish RPGs and would allow EPA to substitute its own RPG preferences, based on nothing more than an assertion that a downwind state would have set a different RPG if it had

been (from EPA's perspective) more assertive in its dealings with an upwind state.

That EPA's proposed guidance is erroneous is confirmed by the interstate consultation provisions EPA purports to interpret, which provide no authority for EPA to second-guess state determinations made through the interstate consultation process. The regional haze rule expressly provides that if a downwind state believes an upwind state should do more to reduce its emissions and the upwind state is uncooperative, the downwind state is to document the consultation and inform EPA of the situation. 40 C.F.R. § 51.308(d)(1)(iv). In the absence of a state conclusion that an impasse in interstate consultations has been reached, EPA has no authority to revisit the interstate determinations that have been made. EPA's proposed new interpretation is therefore inconsistent with the regional haze rule.

EPA's proposed new interpretation is also inconsistent with EPA's existing guidance on these matters. The proposed rule cites and describes a 2006 document, "Additional Regional Haze Questions," in which EPA "encouraged the early identification of any potential disputes to allow all parties ample opportunity to address and document any disagreements" and in which EPA explained that when states disagree over measures necessary to contribute adequately to reasonable progress, the disagreement should be brought to EPA's attention as early as possible. 79 Fed. Reg. at 74,827. This guidance thus makes clear that determinations as to the adequacy of apportionment of emission reduction obligations among upwind and downwind states are for states to make through the interstate consultation process except where states conclude that agreement cannot be reached. Where a state does not invoke the provision of the regional haze rule that authorizes it to inform EPA of a dispute that that state has with other states and where that state uses its discretion under the rules and the CAA to establish an RPG, EPA has no right to assume or conclude that the state meant to or should have invoked that provision but

improperly failed to do so for some unarticulated reason.² Because EPA's proposed guidance takes the opposite position, it is inconsistent with the CAA and the existing regional haze rule and must be withdrawn.

In addition, EPA's proposed guidance includes a statement that contradicts the regional haze rule's provisions concerning regional planning organizations ("RPOs"). EPA acknowledges that its rules allow states to satisfy the RPG analysis technical documentation requirement by relying on RPO technical analyses approved by all state participants. *Id.* at 74,829.³ EPA goes on to state, however, that "[i]n situations where a regional planning organization's analyses are limited, incomplete or do not adequately assess the four factors, ... states must fill in any remaining gaps to meet this requirement." *Id.* EPA does not explain what it means by this statement, but the vague assertion that reliance on RPO technical analyses might not be appropriate contradicts the plain language of the regional haze rule (in particular, 40 C.F.R. § 51.308(d)(3)(iii)). Because the proposed guidance is inconsistent with the regional haze rule, it should be withdrawn.

EPA in any event cannot apply its novel interpretation – which, in effect, constitutes new

² EPA cites the floor statements of three senators to support its argument that, in enacting the regional haze program, "Congress was motivated in part by the dilemma of Vermont and other downwind states." 79 Fed. Reg. at 74,830. By citing Vermont, EPA appears to be referring to its discussion of *Vermont v. Thomas*, 850 F.2d 99 (2d Cir. 1988), and the dispute between Vermont (the downwind state) and upwind states that, in Vermont's view, were not adequately controlling emissions from their sources. As an initial matter, the floor statements of individual members of Congress do not constitute the views of Congress. *See, e.g., Kenna v. U.S. Dist. Court for C.D. Cal.*, 435 F.3d 1011, 1015 (9th Cir. 2006). Moreover, in *Vermont*, the downwind state unequivocally stated its opposition to the emission control decisions and policies of upwind states and in fact brought litigation to seek resolution of its dispute. That set of facts bears no resemblance to the facts here.

³ EPA adds that "regional haze is a regional problem that requires regional solutions." 79 Fed. Reg. at 74,830. This statement would seem to acknowledge the important and legitimate role played by the RPOs and that RPO-developed regional solutions are more appropriate than FIP requirements imposed by EPA.

SIP requirements – retroactively. *See Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208-09 (1988). If EPA wants to change the rules to which states must adhere in developing SIPs and discharging their implementation responsibilities under the regional haze program, EPA must conduct national rulemaking – clearly designated as such – and may only make any changes effective on a prospective basis. EPA thus cannot use its proposed new guidance as a basis for disapproving any part of the Texas SIP or the Oklahoma SIP.

III. Texas and Oklahoma Satisfied the Interstate Consultation Requirements, and EPA Therefore Has No Authority To Disapprove the SIPs Based on EPA’s Unfounded Assertion that the States Failed To Meet Those Requirements.

EPA’s proposed rule describes the interstate consultation undertaken by Texas and Oklahoma. 79 Fed. Reg. at 74,843-44. EPA’s proposed determination that Texas and Oklahoma failed to satisfy their interstate consultation obligations with respect to one another is without foundation and cannot serve as a basis for disapproving either state’s RPGs or any other part of their regional haze SIPs.

A. Texas Satisfied Its Interstate Consultation Obligations.

EPA correctly proposes to find that Texas fulfilled its consultation obligations under the regional haze rule with respect to states whose emissions affect visibility in Texas Class I areas. *Id.* at 74,844. EPA proposes, however, to disapprove Texas’s regional haze SIP, in part, because EPA does not believe that Texas fulfilled its interstate consultation obligations with respect to Oklahoma. The proposed rule describes in considerable detail the consultation between Texas and Oklahoma, *id.* at 74,854-57, and demonstrates that Texas engaged in a comprehensive consultation process that satisfied all of the regional haze rule’s applicable requirements, *see id.* at 74,855.

That process concluded with both states agreeing that no emission reductions from Texas

in addition to those modeled by the Central Regional Air Planning Association (“CENRAP”) would be needed to ensure reasonable progress for Oklahoma. *Id.* Under the regional haze rule, that should be the end of the matter. EPA nevertheless proposes to disapprove Texas’s consultation because EPA “believe[s] that the technical analysis developed by Texas did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma.” *Id.* at 74,856. EPA, however, provides no evidence for any such conclusion and does not and cannot support its proposed determination that Texas failed to satisfy its obligation to consult with Oklahoma and to provide any information needed for consultation. To the contrary, the record demonstrates that both Texas and Oklahoma participated in CENRAP and that both Texas and Oklahoma included in their SIP submissions documentation and emission reduction measures necessary to effectuate the RPO’s recommendations. The proposed rule simply asserts that participation in an RPO “does not automatically satisfy a state’s obligation to ‘demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal’ for a Class I area.” *Id.* No such statement appears in the regional haze rule. In fact, the rule refutes EPA’s proposed determination here by providing that

[w]here other States cause or contribute to impairment in a mandatory Class I Federal area, the State must demonstrate that it has included in its implementation plan all measures necessary to obtain its share of the emission reductions needed to meet the progress goal for the area. *If the State has participated in a regional planning process, the State must ensure it has included all measures needed to achieve its apportionment of emission reduction obligations agreed upon through that process.*

40 C.F.R. § 51.308(d)(3)(ii) (emphasis added). The same conclusion is supported by the regional haze rule’s technical-documentation provision:

The State must document the technical basis, including modeling, monitoring and emissions information, on which the State is relying to determine its apportionment of emission reduction obligations necessary for achieving reasonable progress in each mandatory Class I Federal area it affects. *The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants.*

Id. § 51.308(d)(3)(iii) (emphasis added). Far from providing or suggesting that emission control measures agreed on through the RPO process are merely a starting point for analysis, the regional haze rule equates adoption of all measures agreed on through the RPO process to the demonstration that a SIP contains all necessary measures. EPA's statements to the contrary in this proposed rule are inconsistent with its own regulations and cannot support disapproval of the interstate consultation component of the Texas SIP.

Further, as EPA notes, "[i]n fact, the TCEQ [Texas Commission on Environmental Quality] went beyond the CENRAP analysis by contemplating additional controls, applying a lower cost-effectiveness threshold and estimating the visibility benefit from the identified control set." 79 Fed. Reg. at 74,857. Moreover, Texas relied on that supplemental analysis – in addition to CENRAP's analyses and conclusions – "to inform its decision not to control any additional sources, including those that impact the visibility at the Wichita Mountains and other Class I areas in other states." *Id.*

Ironically, despite the fact that Texas "went beyond" the requirements of the regional haze rule, *id.*, EPA proposes to conclude that Texas did not prepare *enough* analyses to evaluate completely its reasonable progress obligations or to permit Oklahoma to establish in a fully informed way the RPGs for Wichita Mountains. *Id.* at 74,861, 74,862. EPA does not establish a legal basis for disapproving Texas's SIP on these grounds. Indeed, EPA does not explain how the CENRAP modeling was inadequate or how it differed from the modeling conducted by the

other RPOs and does not explain how or why Texas's additional modeling was also inadequate. EPA only asserts vaguely that additional "refine[ment] from a high level state" was necessary and that "it [is] necessary to undertake a cost/control and visibility analysis which is presented in our FIP TSD [Technical Support Document]" to support adequate reasonable progress determinations. *Id.* at 74,861. No support exists in the regional haze rule for any such requirements, and EPA never provided Texas with guidance suggesting that refined modeling and additional analyses were necessary components of or prerequisites to an approvable regional haze SIP. A state (or EPA, when it is authorized to promulgate a FIP) may choose to undertake such additional analyses, but they are not legally required of a state. Thus, the absence of such analyses can provide no basis for disapproving Texas's regional haze SIP.

B. Oklahoma Satisfied Its Interstate Consultation Obligations.

For many of the same reasons that are discussed above, EPA's proposed disapproval of Oklahoma's RPGs for Wichita Mountains is unsupported and contrary to the CAA and EPA's regional haze rule. As it does with respect to Texas, the proposed rule makes clear that Oklahoma undertook every action required by the regional haze rule, including reliance, as contemplated by the regional haze rule, on CENRAP's modeling. *Id.* at 74,864-65. Oklahoma's consultation, as described in the proposed rule, was extensive. *Id.* at 74,865-67. As a result of the consultation, Oklahoma requested three specific actions from Texas: (1) that Texas require new and modified sources subject to EPA's prevention of significant deterioration ("PSD") program to conduct analyses of their impacts on visibility at Wichita Mountains; (2) that Texas give Oklahoma an opportunity to review and comment on PSD determinations regarding "best available control technology" for proposed projects likely to affect visibility at Wichita Mountains; and (3) that Texas extend evaluations of visibility impacts from within 100

kilometers of Wichita Mountains to within 300 kilometers of Wichita Mountains. *Id.* at 74,866. As EPA’s proposed rule explains, Texas agreed to Oklahoma’s first two requests and committed to working with the Federal Land Managers (“FLMs”) and with Oklahoma to develop a protocol to determine when a proposed PSD source should conduct a Class I area review. *Id.*

EPA goes on to describe Oklahoma’s consideration of the reasonable progress factors and its assessment of the reasonableness of the URP during the first planning period. *Id.* at 74,868-

69. EPA states:

After considering the URP, the results of the CENRAP modeling and the four reasonable progress factors, ... [Oklahoma] determined that meeting the URP goal for 2018 was not reasonable. It then adopted the 2018 projected visibility conditions from the CENRAP photochemical modeling as the RPGs for the 20% best days and 20% worst days for the Wichita Mountains.

Id. at 74,869. As a result of the regional consultations and Oklahoma’s consideration of the URP and the reasonable progress factors, Oklahoma developed RPGs for Wichita Mountains that comply with the regional haze rule requirements that RPGs “provide for an improvement in visibility for the most impaired days over the period of the SIP and ensure no degradation in visibility for the least impaired days over the same period.” *Id.* at 74,865.

Nevertheless, EPA proposes to disapprove the Oklahoma RPGs due to a purported “incomplete consultation” with Texas “that resulted in inadequate reasonable progress towards the national visibility goal.” *Id.* The source, nature, meaning, and parameters of EPA’s putative “completeness” criterion are utterly unclear and undefined. Ultimately, however, the supposed shortcoming in Oklahoma’s consultation efforts, according to EPA, is that “the technical analysis developed by Texas did not provide the information necessary to identify reasonable reductions from its sources, and inform consultations in order to develop coordinated management strategies with Oklahoma.” *Id.* at 74,871. Apparently, EPA’s theory is that if Texas had

provided more analysis, or if Oklahoma had demanded it, Oklahoma would have realized that Texas was not offering emission reductions consistent with reasonable progress requirements and that Oklahoma would have asked EPA to press Texas for additional emission reductions.

This EPA rationale for proposing to disapprove the Oklahoma consultation component of its regional haze SIP and, as a result, its RPGs is fatally flawed for at least two reasons. First, there was no shortcoming in the technical analyses Texas provided to Oklahoma. As noted above, the information Texas provided not only satisfied the regional haze rule's requirements, it exceeded them. Indeed, elsewhere in the proposed rule EPA states that, in its view, information in the record "showed that cost-effective controls on Texas sources were likely available" and that information in the record documented the impact of Texas sources on Wichita Mountains. *Id.* Given those acknowledgements by EPA, EPA cannot logically maintain that Oklahoma lacked the information from Texas that was necessary to apprise Oklahoma that Texas might be able to contribute additional emission reductions. Second, EPA is not empowered to intervene in the interstate consultation component of the regional planning process that the CAA directs. States and RPOs conduct the technical analyses needed to inform decision-making, and then states must decide for themselves whether they believe the consultation process has been successful or whether, instead, to seek EPA resolution of interstate disagreement.

Oklahoma had all of the information it required, consistent with the regional haze rule, to make appropriate RPG determinations through the interstate consultation process. EPA, accordingly, has no basis for finding that Oklahoma's interstate consultation with Texas was incomplete or that its RPGs for Wichita Mountains fail to represent reasonable progress.

IV. EPA Does Not Provide Any Lawful Basis for Disapproving the RPGs for Big Bend and Guadalupe or the Texas LTS.

The hallmark of the CAA's regional haze program is state primacy in all substantive decision-making, including in particular the evaluation of reasonable progress and the establishment of RPGs. Indeed, EPA's "Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program" (June 1, 2007), Doc. ID No. EPA-R06-OAR-2014-0754-0012, TX166-012-10 ("Reasonable Progress Guidance"), provides that the regional haze rule "gives States wide latitude" to determine which measures to require pursuant to the Act's reasonable progress provisions and provides that states "have considerable flexibility" in deciding how to take the reasonable progress factors into consideration, *id.* at 4-2; *see also id.* at 5-1 ("In determining reasonable progress, CAA §169A(g)(1) requires States to take into consideration a number of factors. However, you [*i.e.*, states] have flexibility in how to take into consideration these statutory factors and any other factors that you have determined to be relevant.") (emphasis added); *see also Am. Corn Growers Ass'n v. EPA*, 291 F.3d 1, 5-9 (D.C. Cir. 2002) (*per curiam*) (emphasizing state primacy). EPA nevertheless proposes to disregard the deference that is due to Texas's reasonable progress analysis, its RPG determinations, and its LTS. EPA proposes to disapprove Texas's RPGs for Big Bend and Guadalupe because "the state has not demonstrated that its RPGs provide for reasonable progress towards meeting the national visibility goal" on the grounds that, EPA contends, Texas failed "most notably ... to reasonably consider the four statutory reasonable progress factors and the requirement to adequately justify RPGs that are less stringent than the URP." 79 Fed. Reg. at 74,822. In connection with its proposed disapproval of these RPGs, EPA also proposes disapproval of key elements of Texas's LTS. Apart from EPA's rationale for disapproving Texas's SIP related to Wichita Mountains, addressed above in Section III of these comments, EPA states it is disapproving the Texas LTS

because, in its view, Texas did not adequately consider the emissions limitations and schedules for compliance needed for reasonable progress in Big Bend and Guadalupe. *Id.*

Texas's RPGs and the state's rationale for its determinations fully comport with the CAA, the regional haze rule, and EPA's guidance. Indeed, EPA's statements in the proposed rule illustrate that Texas did everything that was required of it under the regional haze rule. *Id.* at 74,834 ("Based on the emission reductions from these measures, CENRAP modeled the projected visibility conditions anticipated at each Class I area in 2018 and the TCEQ used these results to establish its RPGs. The TCEQ states it developed its RPGs after considering the regulatory factors required under Section 51.308(d)(1)(i)(A)"); *id.* at 74,835 ("TCEQ developed a list of potential controls and costs associated with those controls to inform their four factor analysis. It used the control strategy analysis developed by CENRAP as the starting point for its analysis."). EPA's discussion of Texas's evaluation of the reasonable progress factors also demonstrates that the state conducted a lawful and appropriate reasonable progress analysis. *Id.* at 74,837-38. Texas evaluated the costs of compliance and, in doing so, set cost thresholds that it determined reasonably differentiated between reasonable and unreasonable levels of expense. *Id.* at 74,837. It considered time necessary for compliance and remaining useful life of affected sources and found that these factors were likely not determinative. *Id.* It qualitatively assessed energy and non-air-quality environmental impacts, concluding that this factor generally weighed against additional controls, but did not rest its decision on its assessment of that factor. *Id.* Further, Texas identified the suite of emission controls that could be deployed at various Texas sources and conducted modeling to evaluate the degree of visibility improvement that could be achieved at affected Class I areas. 79 Fed. Reg. at 74,837. Reasonably – and certainly within the broad bounds of state discretion in this area – Texas determined that the costs of

additional controls were not warranted in part due to the minimal degree of visibility improvement that those controls could achieve. *Id.* All of these determinations comport with the CAA, the regional haze rule, and EPA’s Reasonable Progress Guidance.

EPA rests its proposed disapproval on its *disagreement* with Texas’s determinations and on EPA’s *policy preferences* for different choices. For instance, EPA states the Agency “believe[s] the overall RPG goals [sic] that Texas established for its own Class I areas of Big Bend and Guadalupe Mountains do not provide for reasonable progress based on the four reasonable progress factors that a state is required to consider.” *Id.* at 74,834. Similarly, EPA states that it “disagree[s] with the set of potential controls identified by the TCEQ and how it analyzed and weighed the four reasonable progress factors in a number of key areas.” *Id.* at 74,838. These sort of “believe[s]” and “disagree[ments]” are not lawful grounds for disapproving a regional haze SIP.

The allegations of more specific purported flaws that EPA identifies do not withstand scrutiny. For example, EPA states that, “[i]n general, the cost of compliance was the key factor considered by the TCEQ,” suggesting that Texas gave improper weight to this factor. *Id.* at 74,837. The rest of EPA’s discussion, however, shows that Texas gave appropriate weight to each factor and, as noted above, that the state also considered the degree of visibility improvement that would result from additional reasonable progress measures. *Id.* at 74,838 (“The TCEQ’s assessment of reasonable progress rested primarily on its calculation of the total cost of the controls it analyzed versus the visibility benefits at the ten Class I areas it analyzed.”).

EPA also states that “because the TCEQ did not evaluate controls on a source-by-source basis, source-specific factors related to the evaluation of the reasonable progress four factor analysis could not be considered,” and for that reason, EPA proposes to determine that Texas’s

analysis is “insufficient.” *Id.* at 74,838, 74,841. States are not, however, required to conduct reasonable progress assessments on a source-by-source basis. This is confirmed by EPA itself in the Reasonable Progress Guidance, which states that the cost factor can be evaluated “for individual sources *or source categories*.” Reasonable Progress Guidance at 5-1 (emphasis added). State discretion to conduct a reasonable progress assessment without analyzing controls on a source-by-source basis has been confirmed by the U.S. Court of Appeals for the Tenth Circuit. *WildEarth Guardians v. EPA*, 770 F.3d 919, 944 (10th Cir. 2014) (“Neither the Clean Air Act nor the Regional Haze Rule requires source-specific analysis in the determination of reasonable progress.”). EPA fails to acknowledge this established law and cites no support for its conclusion. Moreover, after conducting its own source-by-source analysis, all that EPA is able to reach is a vague, open-ended conclusion:

These results also *suggest* that controlling a small number of sources will result in visibility benefits at both Class I areas, and that rather than evaluating controls at all facilities identified by Texas combined, a subset of those facilities (and some additional facilities not identified) *may be reasonable*.

79 Fed. Reg. at 74,839 (emphases added). Despite the fact that this sentence appears to be incomplete, what *is* clear from it is that the most EPA can even assert is that different regulatory determinations than the ones that Texas made in its SIP *might* have been “reasonable” policy choices. Plainly, that is no basis for disapproving a SIP.

EPA also suggests that it must disapprove Texas’s SIP because EPA “believe[s] that in performing its control analysis, the TCEQ should have given greater consideration to the flexibility in the CAIR trading program and the resulting uncertainty in the projected emissions.” *Id.* at 74,840. To explain its point, EPA highlights the difference in Texas’s Integrated Planning Model-based estimates of emission reductions due to CAIR at Big Brown Unit 1 versus Big

Brown Unit 1's actual emissions in 2012. *Id.* EPA cannot fault Texas for being unable to predict the future. The modeling that Texas relied on was the best information available at the time it submitted the SIP, which it did long before 2012, and EPA cannot validly judge a SIP unapprovable on the basis of information that became available for EPA's review only after the SIP was submitted and *only because EPA has missed its statutory deadline* for action on the submitted Texas SIP by nearly five years.

EPA also takes issue with the cost threshold Texas used to exclude certain controls from consideration. Texas chose \$2,700 per ton, while EPA prefers \$4,000 per ton to \$5,000 per ton. *Id.* at 74,838. This preference is not a reason for disapproving Texas's SIP. Indeed, the only purported justification that EPA can muster – that reliance on the \$2,700-per-ton cost threshold EPA used in CAIR is inappropriate because “[a] state should look beyond BART for additional reductions when developing its long-term strategy to achieve reasonable progress at its Class I areas” – conflicts with EPA's own guidance indicating that BART may reasonably be concluded to satisfy reasonable progress requirements in the first planning period. *Id.*; Reasonable Progress Guidance at 4-2 to 4-3. EPA cites – and can cite – no basis in the CAA or in the regional haze rule for disapproving Texas's cost threshold.⁴

⁴ Moreover, although the point is not directly relevant to this proceeding, EPA's statement in the preamble to the proposed rule that “the URP does not establish a ‘safe harbor’ for the state in setting its progress goals,” 79 Fed. Reg. at 74,834, is wrong and should be corrected by EPA. The language in the preamble to the 1999 regional haze rule that EPA quotes confirms that there is, in fact, such a safe harbor. EPA there made clear that if a state determines that the progress the URP would require is reasonable, then “the State *should* identify this amount of progress as its reasonable progress goal for the first long-term strategy.” 64 Fed. Reg. 35,714, 35,732 (July 1, 1999) (emphasis added). *Only if* the state instead “determines that additional progress is reasonable” should the state adopt a more accelerated or ambitious RPG than the URP. *Id.* As this preamble language makes clear, the state has no obligation to undertake additional analysis if it determines the URP is reasonable for its Class I area. The decision whether to undertake such additional analysis is a matter reserved for the state's exercise of discretion.

Furthermore, EPA states that it proposes to disapprove Texas's URP analysis because "we do not *believe* that the rate of improvement the TECQ [sic] has selected is reasonable, because we *disagree* with its four factor analysis and the analysis of emission measures needed to meet the URP." 79 Fed. Reg. at 74,843. This is not a lawful basis for a SIP disapproval. Texas has complied with the regional haze rule's requirements with respect to a URP analysis, and, for the reasons stated above, EPA has not provided a valid justification for disapproving Texas's reasonable progress analysis.

Finally, EPA proposes to disapprove Texas's calculation of the URP as a result of its proposal to disapprove the state's calculation of natural visibility conditions at Big Bend and Guadalupe. *Id.* at 74,822. The primary reason for this proposed disapproval is Texas's assumption that fine soil and coarse mass concentrations, and their resulting light extinction effects, is entirely attributable to natural sources. *Id.* at 74,831. Texas provided a reasoned justification for its decision in this regard, explaining that "to the extent its assumption that 100% of coarse mass and fine soil is natural is an overestimate, it expects that its low organic carbon estimate will more than compensate for any errors in this assumption at this time." *Id.* Despite the reasonableness of this finding, Texas, at the FLMs' request, performed a supplemental analysis assuming that only 80 percent of this particulate matter was from natural sources. *Id.* In the final analysis, the FLMs recognized that EPA's regulations at "40 CFR 51.308 give[] the State [the] right" "to recalculate natural conditions for Big Bend [National Park] and Guadalupe Mountains [National Park]" and agreed that "the basic approach used [by Texas] to adjust natural conditions is reasonable, provided that the Proposed SIP address the uncertainty of the assumption that all of the coarse mass and fine soil fraction on the worst 20 percent days is

natural.”⁵ Texas’s final SIP submission provides the basis for the assumption, as the FLMs requested.⁶ In contrast, EPA, without any meaningful analysis, would impose use of default values for this particulate matter provided for in the IMPROVE equation and proposes disapproval of the Texas SIP on that basis. *Id.* at 74,832. EPA provides no basis for rejecting Texas’s reasoned explanation. Particularly in light of the FLM comments and Texas’s rationale for using 100 percent, EPA has a duty to fully explain and to provide an adequate rationale for selecting the default values over Texas’s determination. EPA failed to discharge that duty, and its proposed action is improper for that reason as well.

V. EPA’s Proposed FIPs for Texas and Oklahoma Are Unlawful.

Because EPA has no basis for disapproving the Texas and Oklahoma regional haze SIPs, its proposed FIPs are by definition unlawful. But even assuming for the sake of argument that EPA’s SIP disapprovals were valid, the proposed FIPs would violate the CAA and the regional haze rule. The FIPs are based on a flawed and incomplete reasonable progress analysis and would require emission reductions that are beyond EPA’s authority to impose in this rulemaking.

EPA’s assessment is irrationally based on visibility conditions modeled against “natural conditions.” EPA acknowledges in its FIP TSD that visibility improvement “based on the 2018 background conditions provides an estimate of the amount of benefit that can be anticipated in 2018 and the impact a control/emission reduction [sic] may have on the established RPG for 2018.” EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans (FIP TSD) at A-39 (Nov. 2014), Doc. ID No. EPA-R06-OAR-2014-0754-

⁵ U.S. Fish & Wildlife Serv. & Nat’l Park Serv., Comments on Texas Proposed Regional Haze Rule State Implementation Plan at 2, 3 (Jan. 11, 2008), Doc. ID No. EPA-R06-OAR-2014-0754-0002, TX166-002-03.

⁶ See generally TCEQ, Revisions To The State Implementation Plan (SIP) Concerning Regional Haze at Appendix. 5.2 (adopted Feb. 25, 2009), Doc. ID No. EPA-R06-OAR-2014-0754-0002, TX166-002-05 (“2009 Texas SIP”).

0007 (“FIP TSD”). Instead of considering real-world visibility impacts, however, EPA relies on a hypothetical visibility benefit measured against pristine conditions that will not exist. Indeed, EPA’s approach entirely ignores visibility impairment due to emissions from non-U.S. sources, over which Texas has no control. The effects of those emissions are significant. Texas concluded that they account for “52 percent of the impairment at Big Bend and 25 percent of the impairment at Guadalupe Mountains.” 2009 Texas SIP at 10-10. Because EPA’s assessment is based on unsupportable assumptions that distort its analysis of reasonable progress, its proposed FIP is arbitrary and capricious.

EPA’s assessment also fails to address reasonable progress for the 20 percent best days, as required by the regional haze rule. EPA’s assessment is focused exclusively on visibility impacts on the 20 percent worst days and, accordingly, fails to satisfy the minimum requirements of the regional haze rule.

Moreover, EPA’s FIP would impose requirements that cannot be achieved during the first planning period of the regional haze program. This is a problem of EPA’s own making. It is, moreover, inconsistent with EPA’s regulations and requires that the FIP be withdrawn. According to EPA, the Agency received the Texas regional haze SIP on March 31, 2009. Pursuant to CAA § 110(k)(1)(B), that plan was deemed complete by operation of law on September 30, 2009. Pursuant to CAA § 110(k)(2), therefore, EPA was obligated to take *final* action on the Texas SIP by September 30, 2010. EPA did not publish even its *proposed* action on the Texas SIP until December 16, 2014, and EPA is not scheduled to take *final* action on that SIP until September 4, 2015, nearly five years after the statutory deadline. After years of delay, EPA now proposes to disapprove (in part) Texas’s regional haze SIP for the first planning period of the regional haze program, which runs from 2008 through 2018, and to impose requirements

that, by EPA's admission, cannot be implemented until 2020, well after the end of the program's first planning period and, thus, well after the date by which the RPG is to be achieved. EPA has no authority to take this action.

Consistent with EPA's regulations, the Texas SIP submission covers only those emission reductions needed in the first planning period. The CAA and EPA's regional haze rule state that, in assessing measures needed to achieve reasonable progress, states (and EPA) must take into account "the time necessary for compliance" with those measures. CAA § 169A(g)(1); 40 C.F.R. § 51.308(d)(1)(i)(A). One critical consideration is whether measures intended to ensure reasonable progress during the first planning period can in fact be implemented during that planning period. Indeed, EPA's Reasonable Progress Guidance expressly states that "[i]t may be appropriate" for states, in assessing the time-necessary-for-compliance factor, "to use this factor to adjust the RPG to reflect the degree of improvement in visibility achievable within the period of the first SIP if the time needed for full implementation of a control measure (or measures) will extend beyond 2018." Reasonable Progress Guidance at 5-2. Accordingly, reasonable progress requirements for emission reductions that could not or would not be required to be achieved within the first planning period should be adjusted, consistent with the RPGs that are intended to reflect those emission reductions, to mandate only those reductions that in fact can be achieved within the first planning period. As EPA explained in the Reasonable Progress Guidance, where time constraints "preclude the installation of controls ... by 2018, the visibility improvement anticipated from installation of controls at the ... sources that *could* be controlled within the strategy period [*i.e.*, by 2018] should be considered *in setting the RPG and in establishing the SIP requirements to meet the RPG.*" *Id.* at 5-2 (second emphasis added).

EPA candidly acknowledges that its FIP would impose requirements that extend beyond

the first planning period. 79 Fed. Reg. at 74,874 (“we cannot assume that the SO₂ controls we are proposing will be installed and operational within this planning period, which ends in 2018”). Instead of adjusting its proposed reasonable progress requirements, however, EPA proposes to maintain its post-2018 emission reduction requirements but to exclude the effects of the post-2018 emission reductions from the calculation of the RPGs it proposes:

We note that we do not anticipate implementation of the identified scrubber retrofits by the end of 2018. Therefore, we are only adjusting the RPGs established by the states to reflect the additional anticipated visibility benefit from the scrubber upgrades over the 2018 projected visibility conditions.

Id. at 74,866. Although EPA’s proposed RPGs attempt to maintain the illusion that EPA is limiting its rulemaking action to the first planning period, the proposed FIP itself plainly imposes requirements applicable in the second planning period. The proposed FIP thus would violate the CAA’s SIP and FIP provisions, which limit EPA’s promulgation of FIPs to filling any “gap” left by a SIP. CAA § 302(y). Texas’s SIP was properly limited to emission reduction requirements that could be implemented during the first planning period; Texas’s obligation to submit a SIP to address reasonable progress in the second planning period lies in the future, and thus there is at this time no gap that a FIP could lawfully fill with respect to the second planning period. Only if Texas, in the future, defaults on its obligation to submit an approvable SIP addressing reasonable progress for the second planning period could EPA even conceivably have authority to take action with respect to any regional haze requirements that cannot be, and are not required to be, implemented by 2018.

VI. The Proposed Rule Improperly Treats Texas and Oklahoma Differently from Other States and Therefore Violates EPA’s Regulations.

As explained above, EPA proposes to disapprove the Texas and Oklahoma SIPs, in part, because both states relied on CENRAP modeling that EPA believes was incomplete. EPA does

not explain what legally required elements were missing from the CENRAP modeling, and the Agency assertion that it is appropriate to disapprove the Texas and Oklahoma SIPs on this basis is incorrect. To the best of UARG's knowledge, EPA has not rejected reliance on modeling conducted by any other RPO. Indeed, as far as UARG is aware, EPA has not rejected reliance on CENRAP modeling for other states that also participated in CENRAP during this regional haze planning period. This is for a good reason: EPA's regional haze rule expressly countenances reliance on RPO-developed information. EPA's proposal in this rulemaking to reject reliance on CENRAP modeling and analysis is therefore inconsistent with EPA's past actions and its regional haze rule.

In this rulemaking, EPA has adopted new analytical approaches that single out Texas and Oklahoma for unique and unfair treatment. EPA, for instance, appears largely to have abandoned use of the deciview in assessing the Texas and Oklahoma regional haze SIPs, opting instead to use an inverse megameter metric. 79 Fed. Reg. at 74,839 n.208. Such an approach is inconsistent with every other EPA regional haze rulemaking action of which UARG is aware. Further, this approach conflicts with EPA's regional haze rule, which speaks in terms of deciviews and requires that the deciview metric be used. 40 C.F.R. § 51.308(d)(1) ("the State must establish goals (expressed in deciviews)"); *id.* § 51.308(d)(1)(i)(B) ("the State must ... determine the uniform rate of visibility improvement (measured in deciviews)"); *id.* § 51.308(d)(2) ("the State must determine the following visibility conditions (expressed in deciviews)"). Indeed, EPA's proposed rule appears to acknowledge that use of the deciview metric is required, yet EPA ignores that requirement. *See* 79 Fed. Reg. at 74,826. EPA's approach obscures the differences between its own evaluation of visibility impacts and the evaluation conducted by Texas. EPA, for instance, provides no direct comparison of the

visibility impacts it calculated with those estimated by the state. *Id.* at 74,839. EPA's only explanation for relying on the inverse megameter, moreover, contradicts EPA's long-held position that the deciview is the most reliable metric. *Compare id.* at 74,839 n.208 ("Extinction is an appropriate measure for the visibility impairment contribution from individual sources because it avoids the sensitivity of the logarithmic transformation for calculating deciviews to the overall level of visibility impairment including the impacts of other sources.") *with* 64 Fed. Reg. at 35,727 ("the fundamental advantage of using the deciview remains: the deciview metric expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions"). Indeed, EPA itself reverts to reliance on deciviews, at times, to support its proposed FIPs. 79 Fed. Reg. at 74,885-87. In short, EPA provides no rational basis for substituting inverse megameters for deciviews in its proposed rule.

EPA also – apparently for the first time in a regional haze rule – rejects reliance on the CALPUFF model and instead relies on CAMx. *Id.* at 74,877-78. EPA's BART Guidelines, as the proposed rule acknowledges, state that CALPUFF is "the best regulatory modeling application currently available for predicting a single source's contribution to visibility impairment." *See id.* at 74,847. CALPUFF is, moreover, "the only EPA-approved model for use in estimating single source pollutant concentrations resulting from the long range transport of primary pollutants." 70 Fed. Reg. 39,104, 39,122 (July 6, 2005). In previous regional haze rulemakings, EPA has refused to accept anything other than CALPUFF modeling performed using CALPUFF version 5.8, the version of the model approved in EPA regulations. EPA has even rejected visibility modeling that was conducted using more up-to-date versions of CALPUFF that are intended to correct errors in version 5.8. *See, e.g.,* 76 Fed. Reg. 52,388,

52,431 (Aug. 22, 2011) (rejecting modeling results from CALPUFF versions 6.112 and 6.4). The primary rationale that EPA provides to support its use of CAMx here is that “[t]he large distances between sources and Class I areas are outside the typical range of CALPUFF. Because of the range, we were concerned that CALPUFF could overestimate impacts.” 79 Fed. Reg. at 74,878. But EPA provides no technical assessment supporting the reliability of CAMx to model visibility impacts of single sources over long ranges. That the single model on which EPA heretofore has insisted cannot reliably predict impacts over the distances at issue in this proposed rule should have signaled to EPA that its proposed rule is arbitrary and irrational and that those distances are simply too great to allow for imposition of reasonable progress regulations by EPA. In any event, EPA provides no valid basis for using CAMx uniquely here, instead of CALPUFF.

Finally, EPA, without providing any explanation, proposes to treat BART sources in Texas differently from the way all other sources that are subject to BART in other states have been treated. EPA’s Reasonable Progress Guidance states that BART is likely to satisfy all reasonable progress requirements for the first planning period and leaves states with wide latitude to make a determination that it does. *See* Reasonable Progress Guidance at 4-2 to 4-3. Texas submitted a SIP that adopted the position EPA articulates in its guidance by relying on compliance with CAIR to satisfy BART obligations for EGUs that are subject to CAIR in the state. EPA proposes a FIP that would substitute reliance on CAIR with reliance on CSAPR, CAIR’s successor rule, to satisfy those BART obligations. In other states, sources that have relied on CAIR or CSAPR to satisfy BART have not been subjected to additional reasonable progress requirements during the first regional haze planning period. EPA’s proposed decision to require more of Texas is inconsistent with the Agency’s guidance and previous regional haze rulemakings.

In previous regional haze rulemakings, EPA has touted national consistency in analytical approach and consistent results across states and regions as not only a goal but a requirement of the CAA and the regional haze rules. *See, e.g.*, 77 Fed. Reg. 72,512, 72,518 (Dec. 5, 2012) (rejecting reliance on site-specific BART compliance costs in order to promote what EPA characterized as consistent costing methodologies across all states). Even in this proposed rule, EPA notes that the regional haze rule imposes certain requirements “to ensure that states use a common analytical framework and to provide an informed and equitable decision making process.” 79 Fed. Reg. at 74,834. EPA’s proposed action here, however, is anything but consistent with its past actions. Not only is this differential treatment unjustified and inconsistent with the regional haze rule; it also violates EPA’s regional consistency regulations. Those regulations require that EPA “shall assure that actions taken under the [CAA]: (1) Are carried out fairly and in a manner that is consistent with the Act and Agency policy as set forth in the Agency rules and program directives [and] (2) Are as consistent as reasonably possible with the activities of other Regional Offices.” 40 C.F.R. § 56.5(a). EPA’s proposed rule does not pass these basic tests of rational and consistent Agency decision-making.

VII. The Proposed FIP Is Arbitrary, Capricious, and an Abuse of Discretion Because, Based on EPA’s Analyses, It Would Have No Perceptible or Meaningful Effect on Visibility Conditions in Any Class I Area.

For EPA’s proposed rule to justify the enormous costs that compliance with its scrubber upgrade and retrofit requirements would impose, the rule must produce a significant improvement in visibility conditions in the Class I areas that are the subject of the regional haze program. The proposed rule demonstrates, however, that its visibility benefits (if any) will be negligible. Those vanishingly small improvements do not support the emission control requirements that EPA seeks to impose at great cost.

EPA's source apportionment modeling results demonstrate the minimal effects of emissions from the units EPA assesses on visibility in Big Bend, Guadalupe, and Wichita Mountains. *See* 79 Fed. Reg. at 74,839. The highest percentage contribution to total visibility impairment for the 20 percent worst days at Big Bend is the Sommers Deely Spruce facility (also known as the Calaveras Plant) at 0.57 percent. *Id.* at 74,839, Table 12. That facility would not be subject to control requirements under the proposed rule, but the facility with the second highest percentage contribution to the 20 percent worst days at Big Bend (*i.e.*, Coletto Creek) would be subject to control requirements under the proposed rule even though its contribution, as modeled by EPA, is less than one-half of one percent – a mere 0.44 percent. *Id.* And the highest percentage contribution to total visibility impairment for the 20 percent worst days at Guadalupe is Tolk Station at 0.65 percent. *Id.* at 74,839, Table 13. That these minuscule contributions should be targeted by EPA for regulation is irrational on its face.

This conclusion is also supported by EPA's calculation, in deciviews, of the visibility improvement that would result from installation or upgrading of scrubbers at the various facilities it has chosen to assess. EPA proposes to find that scrubber installations are appropriate for Big Brown units 1 and 2, Coletto Creek, Tolk units 171B and 172B, and Monticello units 1 and 2. 79 Fed. Reg. at 74,881-82 & Tables 34-36. Installation of scrubbers at these units does not result in perceptible visibility improvement at any Class I area. On a unit-by-unit basis, estimated visibility improvements are less than 0.5 deciview, EPA's criterion for contribution to visibility impairment. *See id.* Even on a facility-wide basis – and even when measured against natural conditions – the vast majority of the visibility improvements that EPA projects come nowhere near EPA's 1.0-deciview threshold of perceptibility. *See id.* The same is true for the visibility effects of scrubber upgrades that EPA has modeled, which fall far below the 0.5-

deciview contribution benchmark with respect to every unit evaluated. *Id.* at 74,883 & Table 37. EPA’s proposed conclusion that these visibility improvements justify new emission controls is unreasonable.

Finally, the proposed rule acknowledges that even in the absence of the controls EPA now proposes, recent monitoring data at Wichita Mountains “indicate[] that more progress than anticipated by the CENRAP modeling has occurred.” *Id.* at 74,870. EPA notes that for 2009–2013 average conditions for the 20 percent worst days, Wichita Mountains experienced 21.2-deciview visibility conditions, which is *better than* the 21.5-deciview average that CENRAP projected *for 2018*. *Id.* EPA further notes that “[m]ore recent emission inventory data show[] reductions in emissions in most states beyond what was projected in the 2018 modeling, including large reductions in emissions from the Eastern United States [and] [e]missions from non-EGU Texas point sources.” *Id.* Given these facts admitted by EPA, the Agency has failed to explain why the stringent emission reduction requirements in its proposed rule are needed.

Given the negligible visibility benefit that EPA projects to result from the proposed rule’s requirements, and the evidence showing that those requirements will not – and are not needed to – achieve visibility benefits at any Class I area, the huge costs that this rule would impose cannot be justified. EPA should, therefore, withdraw the proposed rule and should instead approve the Texas and Oklahoma regional haze SIP provisions in full.

VIII. Although There Should Be No Need To Promulgate a CSAPR=BART FIP – Because EPA Had No Sound Basis for Disapproving Texas’s CAIR=BART SIP in 2012 – Reliance on CSAPR=BART in Texas Is Appropriate at This Time Given that CSAPR Is Now in Effect.

As EPA notes in the proposed rule, EPA in a separate rulemaking promulgated limited disapprovals of the regional haze SIPs of 14 states, including that of Texas, on the grounds that those SIPs – consistent with EPA’s rules (specifically, 40 C.F.R. § 51.308(c)(4) as in effect at

that time and as affirmed by the U.S. Court of Appeals for the District of Columbia Circuit in *Utility Air Regulatory Group v. EPA*, 471 F.3d 1333 (D.C. Cir. 2006)) – relied on those states’ participation in CAIR to satisfy BART requirements with respect to EGUs’ SO₂ and NO_x emissions. *See* 79 Fed. Reg. at 74,821. After Texas and other states submitted their “CAIR=BART” SIPs, EPA promulgated CSAPR to replace CAIR. 76 Fed. Reg. 48,208 (Aug. 8, 2011). EPA reasoned that because CAIR would no longer be in effect upon CSAPR’s implementation, it was necessary to disapprove SIPs that had lawfully relied on CAIR and to promulgate FIPs replacing reliance on CAIR with reliance on CSAPR for states that were subject to both CAIR and CSAPR. *See* 77 Fed. Reg. 33,642, 33,643 (June 7, 2012). In the same June 7, 2012 rule in which EPA promulgated the limited SIP disapprovals, EPA also promulgated so-called “CSAPR=BART” FIPs for several states, but not for Texas. *Id.* at 33,643, 33,654. In the present rulemaking, EPA proposes a CSAPR=BART FIP for Texas to replace Texas’s reliance on CAIR with reliance on CSAPR. 79 Fed. Reg. at 74,823, 74,844, 74,853-54, 74,888.

For the reasons described in UARG’s comments on the proposed version of EPA’s 2012 rule promulgating the limited disapprovals of the regional haze SIPs of Texas and other states,⁷ EPA had no authority and no sound reason to promulgate limited disapprovals of SIPs that relied on CAIR to satisfy BART. At the same time, UARG recognizes that the June 2012 rule in which EPA promulgated its limited SIP disapproval actions is not directly at issue in the present rulemaking and is the subject of pending petitions for judicial review in the D.C. Circuit. UARG also recognizes that because CSAPR is currently in effect, reliance on participation in CSAPR to

⁷ Comments of the Utility Air Regulatory Group on EPA’s Proposed Rule: Regional Haze: Revisions to Provisions Governing Alternatives to Source-Specific Best Available Retrofit Technology (BART) Determinations, Limited SIP Disapprovals, and Federal Implementation Plans (Feb. 28, 2012), Doc. ID No. EPA-HQ-OAR-2011-0729-0298 (“UARG 2012 Comments”).

satisfy BART requirements for EGUs' SO₂ and NO_x emissions is appropriate pursuant to 40 C.F.R. § 51.308(c)(4) as revised.⁸

IX. EPA Has No Authority To Disapprove Texas's Section 110(a)(2)(D)(i)(II) Interstate Transport SIP Revisions.

As noted above, EPA's proposed rule would disapprove SIP revisions submitted by Texas for the purpose of addressing the CAA's "good neighbor" provision, CAA § 110(a)(2)(D)(i)(II), requiring a state's SIP to "contain adequate provisions ... prohibiting ... any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will ... interfere with measures required to be included in the applicable implementation plan for any other State under part C [of Title I of the CAA] ... to protect visibility," *id.* The proposed rule addresses Texas's section 110(a)(2)(D)(i)(II) visibility-transport SIP revisions related to the 1997 PM_{2.5} NAAQS, the 1997 ozone NAAQS, the 2006 PM_{2.5} NAAQS, the 2008 ozone NAAQS, the 2010 NO₂ NAAQS, and the 2010 SO₂ NAAQS. *Id.* at 74,818. As EPA explains in the proposed rule, Texas indicated in these section 110(a)(2)(D)(i)(II) SIP submittals that its regional haze SIP fulfilled the state's obligations with respect to addressing any emissions that would interfere with measures required to be included in any other state's SIP to protect visibility. *Id.* at 74,821, 74,887. EPA says it proposes disapproval of these SIP submittals because EPA previously promulgated the limited disapproval of the Texas regional haze SIP due to its reliance on CAIR to satisfy BART requirements and because of EPA's "proposed conclusion that additional control of SO₂ emissions in Texas is

⁸ In addition, in light of EPA's determination that "the overall EGU emission reductions from CSAPR are larger than the EGU emission reductions that would have been achieved by CAIR," EPA was correct in its conclusion that it should not, and could not, "disapprove the reasonable progress goals in any of the regional haze SIPs for their reliance on CAIR, including those for Texas." 79 Fed. Reg. at 74,853.

needed to prevent interference with measures required to be included in the Oklahoma SIP to protect visibility.” *Id.* at 74,888.

For reasons explained in preceding sections of these comments, EPA has no valid basis for disapproving Texas’s regional haze SIP. Accordingly, EPA has presented no valid basis, and has no authority, for disapproving Texas’s section 110(a)(2)(D)(i)(II) SIP revisions.



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April 20, 2015

Via Regular Mail and E-Mail [R6_TXOKRegionalHaze@epa.gov]

Mr. Ron Curry, Administrator
EPA's South Central Region (Region 6)
Mr. Guy Donaldson, Chief
Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue
Suite 1200
Dallas, Texas 75202-2733

Docket No. EPA-R06-OAR-2014-0754

Re: Proposed Approval/Disapproval of Texas and Oklahoma Regional Haze State Implementation Plans; Federal Implementation Plan for Regional Haze

Dear Sirs:

Southwestern Public Service Company ("SPS") d/b/a Xcel Energy ("Xcel Energy") respectfully submits the following comments on the U.S. Environmental Protection Agency ("EPA") proposed rule partly approving and partly disapproving the Texas State Implementation Plan ("SIP") addressing regional haze and proposing a Federal Implementation Plan ("FIP"). 79 Fed. Reg. 74,818 (Dec. 16, 2014) (the "Proposal"). SPS is a wholly-owned electric utility subsidiary of Xcel Energy Inc.

Xcel Energy Inc. is a public utility holding company headquartered in Minneapolis, Minnesota with operating companies serving approximately 3.4 million electric customers and 1.9 million natural gas customers in the eight states of Texas, New Mexico, Colorado, Minnesota, Wisconsin, North Dakota, South Dakota, and Michigan.

SPS owns and operates the Tolk Generating Station near Muleshoe, Texas, which EPA proposes to regulate under the FIP. The Tolk Generating Station operates two coal-fired, steam-electric generating units with a total power production capacity of 1,067 megawatts. EPA's Proposal concludes that retrofitting both Tolk units with dry scrubbers to control emissions of sulfur dioxide ("SO₂") is an appropriate control application to demonstrate reasonable progress, despite imperceptible visibility improvements in the Class I areas analyzed in this Proposal.

In these comments, Xcel Energy raises legal, technical and policy concerns with EPA's Proposal, including the lack of deference afforded to Texas in developing its regional haze SIP. In addition, we

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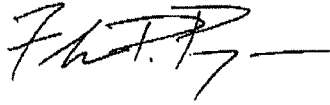
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discuss specific concerns with the Proposal's assumptions regarding retrofit application of dry scrubbers to the Tolk Generating Station.

Xcel Energy appreciates EPA's consideration of these comments in its efforts to finalize the Proposal. If you should have any questions, please contact me at 303-294-2108, Jeff West at 303-571-2762 or Ann Seha at 612-215-4619.

Sincerely,

A handwritten signature in black ink, appearing to read "F. P. Prager", followed by a horizontal line.

Frank P. Prager
Vice President Policy and Federal Affairs
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Mr. Guy Donaldson

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Southwestern Public Service Company d/b/a Xcel Energy
Comments
On the Proposed Approval/Disapproval of Texas and Oklahoma
Regional Haze State Implementation Plans;
Federal Implementation Plan for Regional Haze

Docket No. EPA-R06-OAR-2014-0754

Mr. Ron Curry
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I. Executive Summary

Xcel Energy has multiple major concerns with the proposed federal implementation plan ("FIP") that EPA has proposed for Texas to address regional haze ("Proposal"). Fundamentally, the Proposal partially rejecting the Texas state implementation plan ("SIP") is contrary to the clear allocation of authorities and obligations under the Clean Air Act ("CAA"), and is arbitrary and capricious. The Proposal will produce no visibility benefits beyond what Texas provided in its SIP. Further, because of EPA's refusal to acknowledge and address international emission sources, EPA's FIP will never result in natural background visibility levels, as required by the CAA. Even if every stationary source in Texas were to cease operating tomorrow, Texas' Class I areas would be, and remain, above the uniform rate of progress under either the Texas SIP or EPA's Proposal. EPA's rejection of Texas' attempt to account for the significant visibility impacts resulting from natural, wind-borne particulate matter is arbitrary and capricious. EPA's insistence on relying on its "default" methodology for natural conditions, which EPA acknowledges is inapplicable and inaccurate in an arid, semi-desert region such as West Texas, is manifestly improper and illegal. Finally, EPA's rejection of the cost threshold that Texas applied in deciding whether controls should be required, and EPA's use of significantly higher cost thresholds, has no legal basis, is inconsistent with EPA's own precedent, and is arbitrary and capricious.

The CAA does not allow EPA to simply substitute its judgment for Texas in establishing a regional haze program. Particularly where, as here, EPA's Proposal fails to meet the statutory obligations, imposes dramatically higher costs on Texas sources and electric consumers, and produces admittedly imperceptible, meaningless visibility improvement in Texas' two Class I areas, EPA cannot justify rejecting Texas' well-reasoned regional haze plan. EPA should rescind its rejection of the Texas SIP and approve major portions of the SIP.

EPA's proposal to impose costly controls on Xcel Energy's Tolk Generating Station ("Tolk") is technically and legally unjustifiable. It is based on an incomplete and inadequate analysis of the four statutory factors. It also effectively ignores the minute-to-nonexistent visibility benefit that would result from the proposed controls. Second, EPA ignored its own guidance and precedent in using "light extinction" rather than deciview impacts, to justify inclusion of Tolk in the group of stationary sources controlled under the Proposal. Further, EPA's method of categorizing sources based on percent of light extinction is non-statistical and unsupportable. Using an acceptable statistical categorization method, Tolk should be excluded from the group of controlled sources. EPA also imposes on Tolk the highest cost-per-ton controls of all sources that EPA proposes to control for the smallest expected visibility benefit of any source (as measured in deciviews, EPA's preferred visibility metric).

EPA proposes to require Tolk to install SO₂ scrubbers at a cost of approximately \$400 million in capital costs alone. These costs, however, ignore the other important factors required for installing and operating scrubbers. First, EPA ignored the extremely limited water supplies in the region and the costs that would be required for Xcel Energy to acquire the necessary water rights for the addition of scrubbers. EPA also ignored the costs resulting from making its fly ash unmarketable and the resulting cost of landfilling its ash. EPA also failed to consider the environmental impacts of both further accelerating the already-rapidly depleting aquifer and the requirement to create new landfills.

While EPA is imposing these costs immediately on Xcel Energy and its customers, the visibility benefits from the proposed scrubbers at Tolk are miniscule at best. For instance, at Guadalupe

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Mountains, the required dry scrubber on Tolk 1 would produce a modeled visibility benefit of approximately 0.022 deciviews for the 20% worst days, roughly 1/50 the level for human perception. At the same time, international sources of visibility impairment, which vastly exceed the contributions of Tolk, and indeed all Texas point sources in combination, are left untouched such that there will be no discernable visibility benefit resulting from the entire FIP.

Due to these issues with EPA's Proposal, Xcel Energy respectfully requests that EPA adopt a final rule that approves the Texas Regional Haze SIP's reasonable progress analysis and conclusions or, alternately, conclude that installation of dry scrubbers at Tolk is not justified in light of the miniscule visibility benefit and the high cost.

II. EPA Lacks an Appropriate Basis for its Proposed Disapproval of Portions of the Texas Regional Haze SIP.

A. EPA is required to accord appropriate deference to Texas in reviewing its Regional Haze SIP.

In developing a "cooperative federalism" framework under the CAA, Congress purposely limited EPA's authority by creating a statute in which "air pollution prevention . . . and air pollution control . . . is the primary responsibility of States and local governments." 42 U.S.C. § 7401(a)(3); *see also* 42 U.S.C. § 7407(a) ("Each State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State . . .").

The primary avenue for States to implement their responsibility under the CAA is the promulgation of a SIP. States have "wide discretion" in formulating a SIP. *Union Elec. Co. v. EPA*, 427 U.S. 246, 250 (1976). Once a state submits a SIP, EPA's role is limited to determining whether the plan satisfies the applicable statutory and regulatory criteria. 42 U.S.C. § 7410(k)(3). If a SIP satisfies these requirements, the CAA mandates EPA approval. *Id.* ("[T]he Administrator shall approve such submittal as a whole if it meets all of the applicable requirements of this chapter."); *see also Train v. Natural Res. Def. Council, Inc.*, 421 U.S. 60, 79 (1975) (EPA has "no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the [Act's] standards."); *Luminant Generation Co., LLC v. EPA*, 675 F.3d 917, 926 (5th Cir. 2012) ("EPA may consider only the requirements of the [CAA] when reviewing SIP submissions . . . [T]he agency [has] no discretion to do anything other than ensure that a state's submission meets the CAA's requirements and, if it does, approve it before the passage of [EPA's] statutory deadline.").

The CAA's grant of authority to states under Section 169A is even broader than in other parts of the CAA, so EPA's deference to the states should be even greater in the context of regional haze SIPs. Section 169A of the CAA establishes as a national goal the prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Class I Federal areas, where the impairment is the result of manmade air pollution. 42 U.S.C. § 7491(a)(1). But Congress placed extra emphasis on the primary role of States in CAA regional haze provisions. Congress directed EPA to "provide guidelines to the States" so that States, not EPA, could develop SIPs to implement the program. 42 U.S.C. § 7491(b)(1) (emphasis added); *see also American Corn Growers Ass'n v. EPA*, 291 F.3d 1 (D.C. Cir. 2002) (the regional haze rule "calls for states to play the lead role in designing and implementing regional haze programs").

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The legislative history of the CAA confirms Congress's intent to emphasize State primacy in the regional haze context. Two of the primary sponsors of the visibility provisions, Senator McClure (R-ID) and Senator Muskie (D-ME), addressed the issue directly during the legislative debate over passage of the Clean Air Act Amendments of 1977:

Mr. McClure: Under the conference agreement, does the State retain *sole authority* for identification of sources for the purpose of visibility issues under this section?

Mr. Muskie: Yes; *the State, not the Administrator*, identifies a source that may impair visibility

A LEGISLATIVE HISTORY OF THE CLEAN AIR ACT AMENDMENTS OF 1977, at 374–75 (1979) (emphasis added); *see also* H.R. REP. NO. 95-564, at 155 (1977).

EPA also has repeatedly reaffirmed that States have wide discretion to make regional haze reasonable progress goal (“RPG”) determinations and that States have the primary role in identifying and addressing RPGs:

- “If the *State determines* that the amount of progress identified through the analysis is reasonable . . . *the State should identify* this amount of progress as its reasonable progress goal for the first long-term strategy” EPA Regional Haze Rule, 64 Fed. Reg. 35,714, 35,732 (July 1, 1999) (“RHR”) (emphasis added);
- “As noted in EPA’s Reasonable Progress Guidance, the states have *wide latitude* to determine appropriate additional control requirements for ensuring reasonable progress, and there are many ways for a state to approach identification of additional reasonable measures.” Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,468 (Feb. 27, 2012) (emphasis added);
- EPA has recognized the problems of a rigid requirement to meet a long-term goal. “EPA made clear in the RHR that the RPG is not a mandatory standard which must be achieved by a particular date.” *Id.* at 11,473; *see* RHR, 64 Fed. Reg. at 35,733 (“[T]he [RPG] is a *goal* and not a mandatory standard which must be achieved by a particular date.”);
- “States have significant discretion in establishing RPGs.” Kentucky SIP Approval, 76 Fed. Reg. 78,194, 78,197 (Dec. 16, 2011).¹

To be consistent with the CAA and EPA’s prior SIP determinations under the regional haze program, EPA must review Texas’ SIP with appropriate deference and not simply disapprove the SIP because EPA disagrees with Texas’ assumptions, methodologies, or long-term strategy. Indeed, courts have recognized the distinction between EPA’s limited authority to reject a SIP and its authority to promulgate a FIP. *See Oklahoma v. EPA*, 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) (“[w]e recognize

¹ The emphasis on state primacy also is evident in the Best Available Retrofit Technology (“BART”) context of regional haze programs. *See* BART Rule, 70 Fed. Reg. 39,104, 39,137 (July 6, 2005) (“[T]he Act and legislative history indicate that Congress evinced a special concern with insuring that States would be the decision makers”).

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that the EPA has less discretion when it takes actions to reject a SIP than it does when it promulgates a [FIP]). EPA should be cautious when it unreasonably rejects a State's first, reasonable, detailed technical conclusion. *Id.* at 1225 (J. Kelly, dissenting) (citing *Lockheed Martin Corp. v. Admin. Review Bd.*, *U.S. Dep't of Labor*, 717 F.3d 1121, 1128–29 (10th Cir. 2013)). Such actions are ripe for judicial review and challenge. EPA has repeatedly and unreasonably rejected Texas' well-reasoned technical conclusions in the Proposal. Accordingly, EPA should withdraw its FIP and approve Texas' SIP.

B. EPA arbitrarily applied higher cost effectiveness thresholds for controls on Texas sources without providing any clear justification or identifying any benefits.

CAA Section 169A(g) allows for consideration of the "costs of compliance" in determining RPGs. 42 U.S.C. § 7491(g). In many cases, states have used costs per ton of emissions reduction as a threshold to determine when controls are justified, and when they are not. Texas used a \$2,700 per ton threshold for SO₂ reductions to screen out unreasonably costly RPG technologies. *See* Texas Regional Haze SIP, at 10-7 (2009) ("Texas SIP") (EPA Docket ID EPA-R06-OAR-2014-0754-0002).² The use of this cost threshold as a screen is consistent with other SIPs where EPA has approved regional haze RPG determinations:

- Kentucky SIP Approval, 76 Fed. Reg. at 78,206 (allowing use of \$2,000 per ton SO₂ as a screening threshold based on the Clean Air Interstate Rule ("CAIR") for cost effectiveness);
- North Carolina SIP, 77 Fed. Reg. 11,858, 11,870 (Feb. 28, 2012). EPA approved the State's decision not to implement reasonable progress controls even though cost effectiveness values were described as ranging, "from 912 to 1,922 dollars per ton of SO₂ removed (\$/ton SO₂), and the average costs per utility system ranged from \$1,231 to \$1,375/ton SO₂";
- Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. 20,894, 20,936 (Apr. 6, 2012) (accepting North Dakota's determination that a level of \$2,593 per ton of SO₂ removed was not reasonable and too costly in the reasonable progress context even though it is within the range EPA "ha[s] considered reasonable in the BART context");
- Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. 58,570, 58,630 (Sept. 21, 2011) (finding that North Dakota reasonably rejected cost effectiveness values for SO₂ control options ranging from about \$4,000 to \$5,000 per ton).

Despite these prior actions, in this Proposal, EPA unreasonably rejected Texas' \$2,700 threshold and arbitrarily determined that "a threshold in the range of \$4,000/ton to \$5,000/ton would be reasonable for purposes of identifying potential cost effective controls for further analysis" in Texas' SIP. *See* 79

² Texas noted that this threshold came from EPA's use of an equivalent threshold in the Clean Air Interstate Rule ("CAIR"). EPA has noted that "[g]iven the significant emissions reductions that we anticipate to result from BART, the CAIR, and the implementation of other CAA programs, including the ozone and PM_{2.5} NAAQS, for many States this will be an important step in determining your RPG, and it may be all that is necessary to achieve reasonable progress in the first planning period for some States." EPA, Guidance for Setting Reasonable Progress Goals Under the Regional Haze Program, at 4-1 (June 1, 2007) ("RPG Guidance"). CAIR has been replaced by the Cross-State Air Pollution Rule ("CSAPR"), but EPA's use of a cost effectiveness threshold equivalent to CAIR is still relevant.

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Fed. Reg. at 74,838. This directly contradicts the precedent established in North Dakota and approved by EPA. EPA's only explanation for why a \$2,700 per ton threshold used by the Texas Commission on Air Quality ("TCEQ") is unreasonable is that "although we demonstrated that CAIR was acceptable in lieu of BART, CAIR was not designed as a reasonable progress strategy." *Id.* But this says nothing about using cost thresholds that are equivalent to those used in CAIR. EPA's rejection of Texas' well-reasoned threshold is arbitrary for several reasons.

First, EPA claims that the CAIR program could not be used to demonstrate the RPGs because CAIR would not require emissions reductions to be achieved within Texas. But Texas is not relying on CAIR to meet reasonable progress goals or relying on either CAIR, or its successor rule, the Cross-State Air Pollution Rule ("CSAPR"), in lieu of meeting the RPGs. Rather, Texas simply used the indicative cost level of \$2,700 from CAIR as a basis for deciding not to include some sources under its Regional Haze SIP. Using \$2,700 as a basis for deciding not to require controls for some sources in regional haze requirements is not the same as allowing sources to avoid regional haze requirements by importing allowances. Further, EPA's concern about Texas importing unlimited allowances so as to avoid reducing emissions is not valid here because CSAPR, which replaced CAIR, limits the use of out-of-state allowances that can be used for compliance, and EPA has expressly allowed other states to rely on CSAPR to meet RPGs. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. 46,912, 46,919 (Aug. 6, 2012) (the regional planning organization's "analysis shows emission reductions equivalent to the scale of CAIR are needed to meet reasonable progress goals. . . . EPA believes that with CSAPR providing the reductions that Michigan expects to obtain from CAIR, Michigan's long term strategy can in fact be expected to achieve the state-adopted reasonable progress goals that Michigan established."). The fact that it is impossible to meet the RPGs in Texas does not make it less legitimate to rely on the cost thresholds used in CAIR for identifying reasonable controls.

Second, despite EPA's action in Michigan, in this Proposal, EPA arbitrarily argues that CAIR could be used "in lieu of BART" but not used in the RPG context. While BART and RPGs are distinctive components of a regional haze strategy, EPA provides no reasoned basis for allowing consideration of CAIR in the BART context and rejecting it in the RPG context.³ That EPA would allow CAIR or CSAPR to substitute for BART, which is a unit-specific standard with unit-specific performance criteria, but not for demonstrating reasonable progress, which is a state-wide, multi-source program aimed at reducing the pollutants of concern for regional haze, is illogical, as well as arbitrary and capricious. In fact, EPA has done the exact opposite in other RPG determinations and re-affirmed States' reliance on BART-equivalent analyses. For example, as stated in its proposed approval of the Georgia SIP, "EPA believes it is reasonable to conclude that any control requirements imposed in the BART determination also satisfy the RPG related requirements for source review in the first implementation period." *See* Proposed Georgia SIP Approval, 77 Fed. Reg. 11,452, 11,469 (Feb. 27, 2012); *see also* Final Georgia SIP Approval, 77 Fed. Reg. 38,501 (Jun. 28, 2012). In North Dakota, EPA specifically rejected modeling for RPGs that was not conducted in the same way as BART on the basis that the "ultimate goal is the same." Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,629 n. 85; *see also* Final North Dakota SIP Approval/Disapproval, 77 Fed. Reg. at 20,906-07.

³ It does not make sense to disregard CAIR or CSAPR in the context of RPGs, because *all* electric generating units in the state are subject to their emission limitations, while only some electric generating units are subject to BART.

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Finally, prior EPA reviews comparing cost thresholds used in the BART and RPG context affirm Texas' use of a cost-per-ton threshold that is actually higher than cost-per-ton thresholds used in the BART context. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,630 ("The cost effectiveness value for a new wet scrubber is \$2,593 per ton. While this is within the range of cost effectiveness values that North Dakota, other states, and we have considered reasonable in the BART context, it is not so low that we are prepared to disapprove the State's conclusion in the reasonable progress context."); *North Dakota v. EPA*, 730 F.3d 750, 765 (8th Cir. 2013) (noting that RPGs do not necessarily require BART). Indeed, in promulgating its BART rule, EPA suggested that \$1,500 per ton was a reasonable cost effective threshold for eliminating additional controls. BART Rule, 70 Fed. Reg. at 39,135–36 ("Based on the data before us, the costs of such controls in most cases are less than \$ 1,500 per ton."). Thus, a \$2,700 cost per ton threshold in the RPG context also should be considered reasonable and should not have been rejected by EPA.

In contrast to prior SIP approvals and EPA statements, EPA arbitrarily concluded that Texas' use of the \$2,700 per ton threshold was unreasonable and that a \$4,000 to \$5,000 threshold (a range it had previously rejected as "relatively high") was appropriate. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,630 (rejecting use of wet scrubbers for SO₂ controls based on cost effectiveness values of \$4,735 and \$5,453 per ton SO₂). Even when other states have used a higher cost effective threshold, EPA has rejected expensive cost controls when visibility benefits are "small." *See* New York SIP Approval, 77 Fed. Reg. 24,794, 24,818 (Apr. 25, 2012) (approving State's rejection of selective catalytic reduction ("SCR") to reduce NO_x emissions at cost of \$5,358 per ton due to visibility improvement of only 0.254 at one Class I area). EPA offers no explanation as to why such a relatively high cost threshold is appropriate for Texas sources, particularly since the projected visibility benefits at the Class I areas addressed in the Proposal are smaller than those addressed in the North Dakota SIP and many other states where the cost thresholds were lower. This renders EPA's screening threshold arbitrary and capricious.

C. EPA improperly rejected Texas' decision not to impose further controls in this planning period due to low deciview visibility improvement when it has repeatedly not required further controls in other SIPs.

EPA guidance on implementing RPGs specifically allows states to consider relative impacts in visibility when setting RPGs to ensure that the measures aimed at achieving the uniform rate of progress "are reasonable." *See* RPG Guidance, at 2-3. EPA's RPG Guidance notes that states should look at "other available measures for the sources and source categories that contribute *significantly* to visibility impairment." *Id.* It was never Congress' intent under the CAA to regulate every possible source of visibility impairment in a Class I area. Rather, the intent is only to regulate sources and source categories that *significantly* impair visibility and achieve visibility improvement over a long time horizon.

EPA concludes that the "visibility benefits of SDA scrubbers on the Tolk units are projected to occur mainly at the Guadalupe Mountains." 79 Fed. Reg. at 74,882. EPA estimated that the visibility improvement in 2018 background levels from installing scrubbers at Tolk 1 and 2 (Units 171b and 172b) would be 0.022 and 0.024 deciviews (dv), respectively.⁴ *Id.* at 74,882, Table 36. Even EPA

⁴ EPA's discussion of why CALPUFF modeling, especially at the large distances involved in Texas, would predict higher deciview impacts than CAMx is beside the point. The greater complexity and consideration of the interaction of all relevant

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acknowledges that this level of deciview improvement is “smaller than” deciview improvements from installing scrubbers at emissions units at the W.A. Parish or Welsh plants. *Id.* at 74,882; *see id.* at 74,881, Table 34 (identifying deciview improvements at the Wichita Mountains ranging between 0.020-0.025 dv from the installation of wet scrubbers at Parish Units 5-7 and deciview improvement between 0.022-0.023 dv from the installation of wet scrubbers at Welsh Units 1-3). Nonetheless, EPA inconsistently proposes to control Tolk and do nothing at these other units, stating that “the visibility benefits from installing scrubbers on the W. A. Parish 5, 6, and 7 units; and Welsh 1, 2, and 3 units would not yield large enough visibility benefits to be considered at this time.” *Id.* at 74,882; *see also* New York SIP Approval, 77 Fed. Reg. at 24,818 (rejecting controls based on visibility improvement of 0.254 dv, an amount *10 times greater* than the visibility improvement that would result from EPA’s proposed SO₂ controls at either Tolk unit).

EPA has previously rejected additional controls to achieve reasonable progress even when visibility improvement was magnitudes greater than EPA expects from the installation of scrubbers at the Tolk units:

- In Arkansas, EPA concluded that “a visibility improvement of *only* 0.2 dv” was too low to apply further emission reductions even when Wichita Mountains was not on the URP glidepath. Arkansas SIP Approval, 77 Fed. Reg. 14,604, 14,625 (March 12, 2012) (emphasis added).
- In Arizona, EPA projected benefits of SCR at one project to be 0.41 dv at the most affected Class I area but still rejected SCR for purposes of reasonable progress. This level of improvement is more than nine times greater than the visibility improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Arizona FIP, 79 Fed. Reg. 9,318, 9,360 (Feb. 18, 2014).
- In Montana, EPA found a 0.18 dv improvement to be a “low visibility improvement” that “did not justify proposing additional controls” for SO₂ on one source. This level of improvement is more than four times greater than the visibility improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Montana FIP, 77 Fed. Reg. 23,988, 24,012 (Apr. 20, 2012).
- In Oregon, even with relatively low costs per ton (\$1,816/ton of NO_x), minor visibility improvements were rejected because “adding SNCR only provided an additional 0.18 dv of visibility improvement over NLNB/MOFA at the Mt. Hood Wilderness Area.” This level of improvement is more than four times greater than the visibility of improvement that SDA scrubbers on Tolk would accomplish, at best, at the Guadalupe Mountains. Proposed Oregon SIP, 76 Fed. Reg. 12,651, 12,661 (March 8, 2011).

Although Texas considered visibility improvements, it concluded there were insignificant *cumulative* visibility benefits, measured in deciviews, from requiring additional controls. *See* 79 Fed.

sources offered by CAMx, according to EPA, makes it a better model for assessing regional haze for the long distances between the sources and the Class I areas addressed in the Proposal. At the same time, however, both models provide results in the same parameter: deciviews. And the CAMx model shows a minuscule deciview impact by Tolk on the Guadalupe Mountains National Park.

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Reg. at 74,837, Table 10 (identifying estimated deciview improvements ranging from 0.16 dv in Big Bend to 0.36 dv in Wichita Mountains). EPA previously rejected similar *cumulative* visibility improvements of 0.254 dv and 0.273 dv in the New York SIP as “small.” New York SIP Approval, 77 Fed. Reg. at 24,818. Nevertheless, EPA concluded for Texas that individual sources with de minimis deciview contributions and similarly small deciview cumulative benefits warrant the substantial costs of additional controls based on EPA’s estimate of “extinction benefits and percentage of total extinction.” 79 Fed. Reg. at 74,882. Based on the foregoing, it was manifestly unreasonable and capricious for EPA to reject both Texas’ calculations of low visibility benefit and EPA’s own calculations of low deciview improvement and, as explained below, turn to a novel and unprecedented method for justifying scrubbers at Tolk.

D. EPA has offered no justification for its use of light extinction benefit to select sources for the four-factor reasonable progress analysis.

Disregarding the low deciview improvement projected from installing SO₂ controls on the Tolk units and EPA’s own guidance focusing on deciview improvement, EPA chose to “evaluate[] other metrics, such as *extinction* benefit or *percent of extinction* benefits,” apparently for the sole purpose of justifying inclusion of Tolk in this Proposal. 79 Fed. Reg. at 74,882 (emphasis added). EPA looks at light extinction to argue “that the overall visibility benefit for installing scrubbers on the Tolk units was superior to either the W. A. Parish or the Welsh units.” *Id.* In a footnote, EPA says that “[e]xtinction is an appropriate measure for the visibility impairment contribution from individual sources because it avoids the sensitivity of the logarithmic transformation for calculating deciviews to the overall level of visibility impairment including the impacts of other sources.” 79 Fed. Reg. at 74,839 n. 208. EPA ignores the other problems with using light extinction for such purposes. But, even if there were a technical justification for use of light extinction rather than deciview impacts, EPA never explains why it uses this approach for the first time in reviewing Texas’ SIP or as determinative solely as to the Tolk Generating Station.

EPA’s resort to “light extinction” is directly contrary to its own guidance. Using light “extinction” to assess visibility impairment is never mentioned in EPA’s RPG Guidance or in its own regional haze rules. Rather, EPA’s regional haze rules repeatedly state that visibility conditions for establishing RPGs should be “measured in deciviews” or “expressed in deciviews.” See 40 C.F.R. § 51.308(d)(1) (“the State must establish goals (*expressed in deciviews*) that provide for reasonable progress”); *id.* at § 51.308(d)(1)(i)(B) (“determine the uniform rate of visibility improvement (*measured in deciviews*)”); *id.* at § 51.308(d)(2) (requiring calculations of baseline and natural visibility conditions to be “*expressed in deciviews*”) (emphasis added). EPA also has repeatedly confirmed the use of deciviews versus light extinction when analyzing visibility associated with previous regional haze SIPs. See, e.g., Proposed Georgia SIP Approval, 77 Fed. Reg. at 11,455 (“[t]he deciview is a more useful measure for tracking progress in improving visibility than light extinction itself because each deciview change is an equal incremental change in visibility perceived by the human eye.”); RHR, 64 Fed. Reg. at 35,725 (discussing benefits of using deciviews versus extinction). EPA has no reasoned basis to, for the first time, ignore deciview impacts and use “light extinction” to justify imposing controls on Tolk.

Indeed, it is indicative of the arbitrariness of EPA’s use of light extinction solely for justifying inclusion of Tolk in the group of sources subject to the four-factor reasonable progress analysis that EPA then discusses the visibility benefits of controls *only* in terms of deciview improvement. EPA claims that all of the information it considered regarding the benefits of proposed controls is included in the FIP

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Technical Support Document ("TSD"). 79 Fed. Reg. at 74,882. However, EPA fails to present the benefits of proposed controls in terms of light extinction in either in the Proposal or the FIP TSD. Failing to consistently represent impacts in terms of light extinction arbitrarily obfuscates the purported benefits of the proposed controls.

E. EPA arbitrarily rejected RPGs for Texas despite acknowledging that Texas could not meet the uniform rate of progress.

1. EPA ignores Mexico's contribution to visibility impairment and makes it impossible for Texas to meet the goal of achieving natural visibility conditions.

One of the key elements of EPA's regional haze program is the uniform rate of progress ("URP"), or glide path; a linear line showing visibility improvement between 2004 and 2064 to reach natural levels of visibility in Class I areas. Each State is supposed to achieve emission reductions that assure visibility in the Class I areas improves at a rate equal to or better than the URP.

In this case, it is not possible for Texas to achieve the URP because of the overwhelming contribution from Mexican sources to visibility impairment in the Class I areas. Mexico's impacts dwarf the contribution of any and all point sources in Texas. In fact, Xcel Energy's analysis, as described below, shows that if every point source in Texas were shut down, it would have only a marginal impact on visibility in the Guadalupe Mountains.⁵ It is simply impossible for Texas to meet the URP and the 2064 visibility goal.

Xcel Energy conducted modeling to determine the impact of removing all Texas and U.S. elevated point sources on Guadalupe Mountains. Following the procedures used by ENVIRON, emissions processing was performed using the Sparse Matrix Operator Kernel Emissions ("SMOKE") processing system. For the purpose of this analysis, the point source emissions inventories were updated so that no Texas or other United States elevated point sources would be included in the CAMx modeling input. The SMOKE processing output data was further processed in accordance with ENVIRON's procedures to create the final CAMx emissions input files.

CAMx was run with the updated emissions input files containing no Texas or other United States elevated point sources. The CAMx output files were post-processed using the same scripts and utility programs used by ENVIRON. These intermediate results were further processed using the EPA's Modeled Attainment Test Software ("MATS"). The final MATS output data were then analyzed using the glide path and source contribution workbooks provided by the EPA. Xcel Energy used EPA's process systems and emission input files so EPA can easily replicate this modeling. However, if EPA

⁵ Even EPA's own source apportionment modeling shows that Mexico sources contribute about 16.8% to Big Bend's worst 20% days, which is four times greater than the estimated 4.5% from all of Texas' point source contributions combined. EPA, Technical Support Document for the Oklahoma and Texas Regional Haze Federal Implementation Plans, at A-30 (2014) ("FIP TSD") (EPA Docket ID EPA-R06-OAR-2014-0754-0007). In fact, looking at trajectories from particular sources, Mexico's Carbon I and II facilities (only 165 km away from Big Bend) heavily influenced Big Bend haze conditions, and SO₂ emissions have actually increased since 1999 from these plants. Hampden Kuhns, Mark Green, and Vicken Etyemezian, BIG BEND REGIONAL AEROSOL AND VISIBILITY OBSERVATIONAL (BRAVO) STUDY EMISSIONS INVENTORY, DESERT RESEARCH INSTITUTE, at 4-5, 6-6 (2003), available at http://vista.cira.colostate.edu/improve/studies/BRAVO/reports/FinalReport/BRAVO/A5_Kuhns2003EmissInv.pdf.

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has any difficulty conducting or confirming this modeling, Xcel Energy would be happy to share its modeling files with EPA.

Figure 1 shows the glide path for the Guadalupe Mountains, the most impacted Class I area for the Tolk Generating Station. The uncontrolled haze index value of 16.36 deciviews is the modeled value determined in the 2018 baseline scenario processed by ENVIRON for EPA. TCEQ did not propose additional reasonable progress controls in its SIP, citing the growth and control projections already incorporated into the 2018 baseline emissions data; therefore, the TCEQ SIP value is equivalent to the uncontrolled 2018 baseline scenario value. The EPA FIP value of 16.21 dv corresponds to the modeled haze index obtained from ENVIRON's high control efficiency modeling scenario. The exclusion of all of Texas and other United States elevated point sources resulted in a modeled haze index value of 14.88 dv, meaning that Mexican sources and natural contributions are projected to account for 92%, or all but 1.48 deciviews, of visibility impairment in the Guadalupe Mountains.

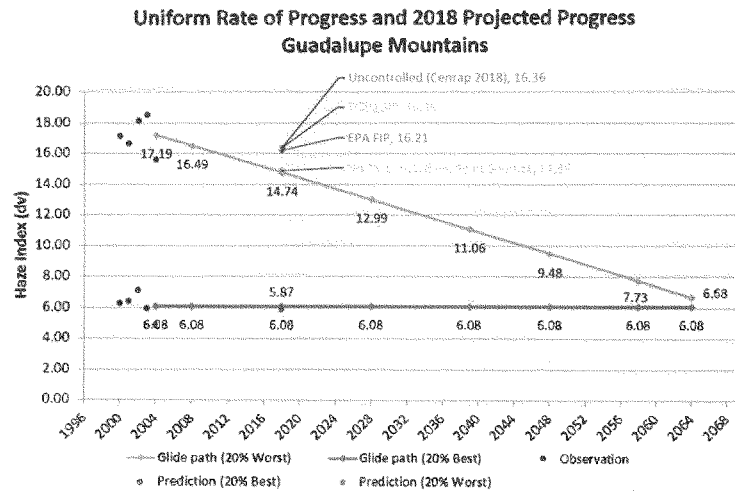


Figure 1. Uniform Rate of Progress and 2018 Projected Progress at the Guadalupe Mountains.⁶

EPA acknowledges that meeting the URP and the 2064 target date is not possible. However, EPA makes no pretense of addressing Mexico's massive contribution and, instead, seeks to impose billions of dollars of costs on the electric customers served by Texas sources for inconsequential

⁶ EPA's numbers in Tables 43 and 44 (79 Fed. Reg. at 74,887) are not entirely accurate because EPA inexplicably truncated certain numbers, including truncating CENRAP's 2018 uncontrolled projection for the Guadalupe Mountains to 16.3 dv. The numbers in Figure 1 above are based on CENRAP's actual 2018 uncontrolled projection for the Guadalupe Mountains of 16.36 dv.

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visibility benefits. Texas cannot be required to over-control in-state sources to make up for EPA's failure to address the far greater international contributions to visibility impairment in Texas' Class I areas.

While EPA "agree[d] with the TCEQ that a rate of improvement necessary to attain natural visibility conditions by 2064 is *not reasonable*," EPA did not "believe that the rate of improvement the [TCEQ] has selected is reasonable" and disagreed with TCEQ's "analysis of emission measures needed to meet the URP." 79 Fed. Reg. at 74,843 (emphasis added). In other words, EPA agreed that Texas reasonably concluded that it could not meet its "glide path" for this planning period. Nonetheless, EPA disapproved of TCEQ's analysis for failing to adequately consider additional controls to further increase its rate of improvement. Yet EPA fails to account for the substantial contributions from international sources in making this determination. And because Texas cannot be required to over-control in-state sources to make up for international contributions, EPA's failure to adequately consider international sources in its disapproval of Texas' RPG analysis is patently unreasonable.

In adopting the regional haze rule, EPA recognized that emissions from international sources will "affect the ability of States to meet [RPGs]." RHR, 64 Fed. Reg. at 35,736. Indeed, EPA stated that the agency "does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution." *Id.*; see also EPA, Additional Regional Haze Questions, at 19 (2006) ("The EPA does not expect States to restrict emissions from domestic sources to offset the impacts of international transport of pollution.").

Over-control of in-state sources due to international contribution is exactly what EPA proposes to require from Texas. EPA has stated that "[t]he glide path is not a presumptive target, and States may establish a RPG that provides for greater, lesser, or equivalent visibility improvement as that described by the glide path." RPG Guidance, at 1-3. In the Proposal, EPA acknowledges that Central Regional Air Planning Association ("CENRAP") modeling demonstrates that over 50% of the visibility impairment at Big Bend comes from international sources. 79 Fed. Reg. at 74,843; see also Texas SIP, at ES-2. And EPA specifically found that "emissions and transport from Mexico and other international sources will limit the rate of progress achievable" by Texas and concluded that efforts to meet the goal of natural visibility by 2064 "would require further emissions reductions not only within Texas, but also *large emission reductions from international sources*." 79 Fed. Reg. at 74,843 (emphasis added). If TCEQ cannot meet the glide path without "large emission reductions from international sources," it is unreasonable for EPA to require additional controls from Texas without making any effort to seek emissions reductions from international sources. EPA is proposing to impose on American companies and American ratepayers the burdens of compliance with the FIP while allowing other countries to avoid any responsibility for their contributions to visibility impairment in Class I areas. The Proposal fails to recognize the elephant in the room and its impact on visibility.

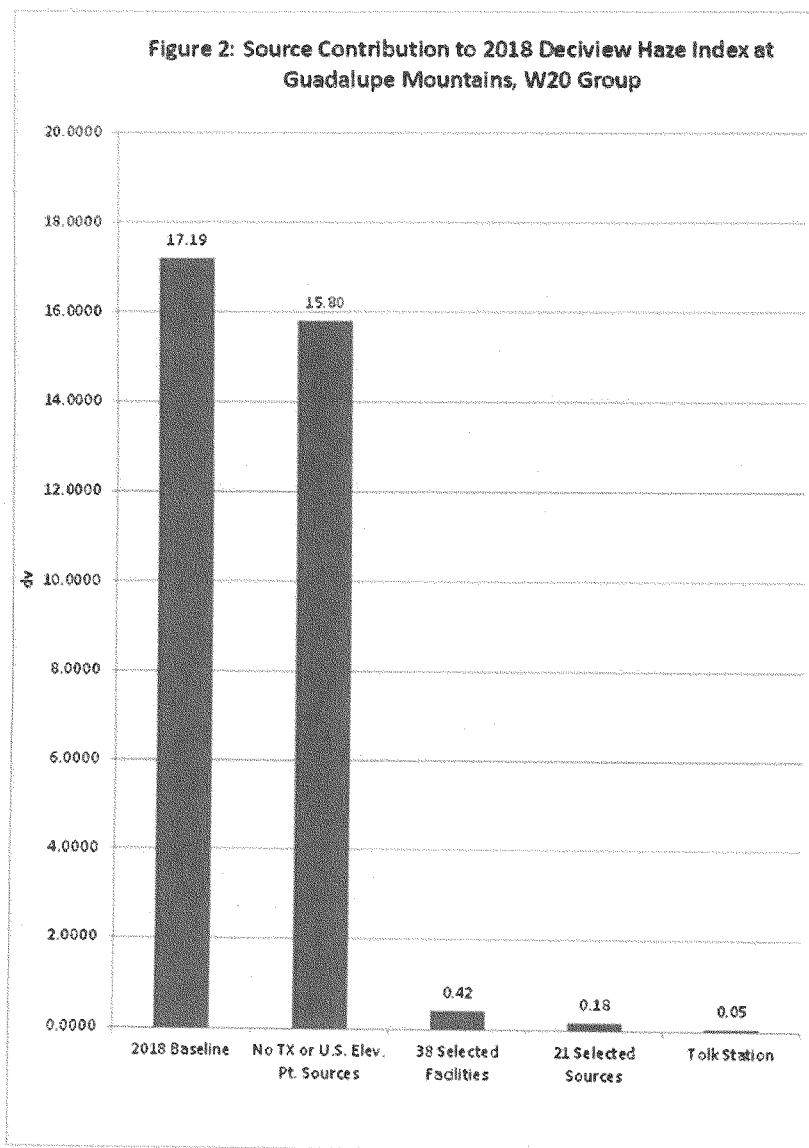
As noted by TCEQ in its Reasonable Progress analysis, significant reductions in emissions from outside the United States will be required to meet the goal of natural visibility at the Texas Class I areas. Texas accurately addressed this issue in preparing its SIP. Even if all sources in the state of Texas were to entirely cease operation, there still would be significant impairment at the Big Bend and Guadalupe Mountains National Parks that would prevent EPA from meeting the goals prescribed by the Clean Air Act and the RHR.

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EPA has inaccurately and arbitrarily dismissed this in its evaluation. In fact, Figures 2 and 3 in the Proposal do not accurately represent the effect of the emissions from Mexico because EPA arbitrarily cut off the top contributors, without showing the full level of their contribution to visibility impairment. 79 Fed. Reg. at 74,878–79. By not showing the visibility impairment to scale, EPA's figures appear to indicate a greater impact from specific facilities in Texas, while depicting a lesser impact from other sources. When the impacts are accurately portrayed, it clearly shows how small a contribution Texas facilities make to visibility impairment. See Figure 2 below.



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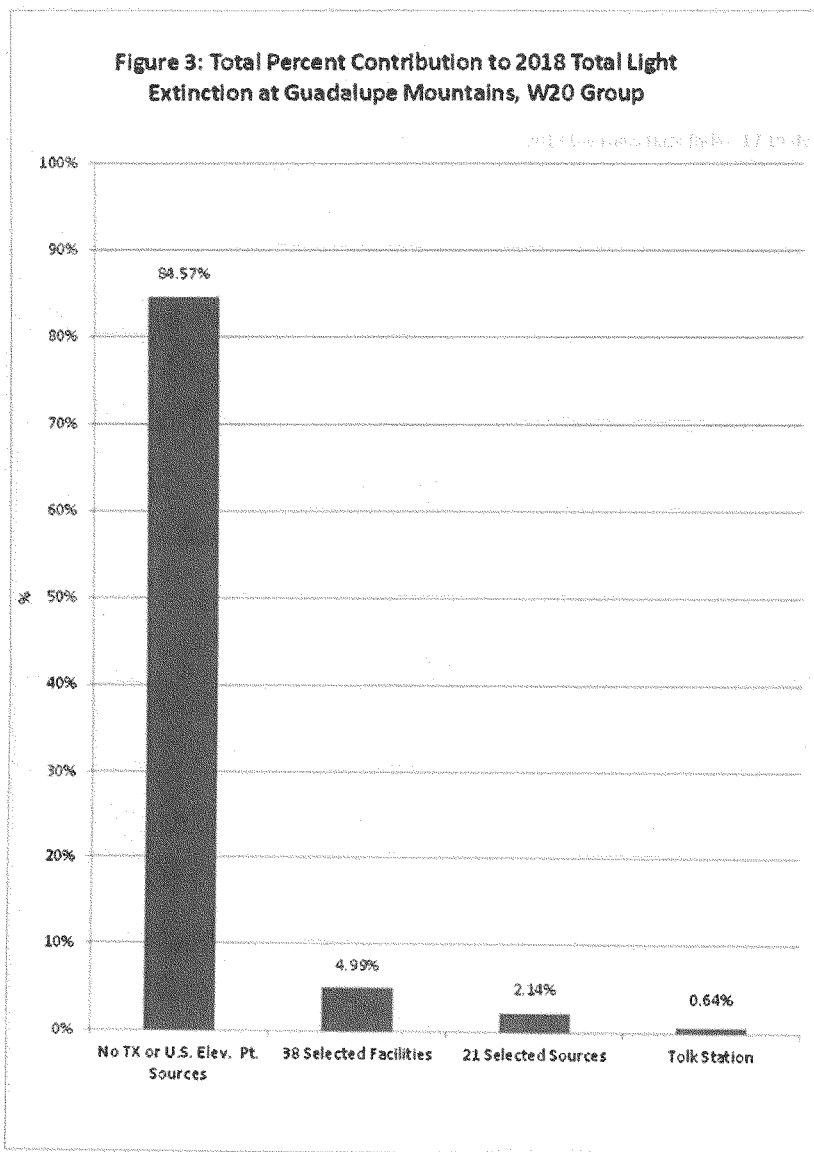
Figure 2 shows the average source contribution to the 2018 deciview haze index at the Guadalupe Mountains. The unaltered 2018 baseline scenario resulted in a haze index of 17.19 dv while the exclusion of Texas and other United States elevated point sources resulted in a value of 15.80 dv. The 38 selected facilities refer to the facilities chosen by EPA for a haze index contribution analysis based on 2009 annual emissions and the distances to the nearest Class I areas (Q/d analysis). The 21 selected sources refer to the emissions sources chosen by EPA to be considered for proposed controls under the FIP and these source collectively contribute only 0.18 dv to the visibility impairment at Guadalupe.

Figure 3 below displays the percent contribution to total 2018 light extinction at the Guadalupe Mountains. These percentage contribution values were calculated based on the collective contribution to light extinction by each source group as compared to the 2018 baseline total extinction value. Here, again, the visibility effects of the EPA selected 21 sources are miniscule in light of the contribution of international sources and natural contributions.

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According to EPA's own rules, it was EPA's duty to consult with Mexico on international contributions. As the Agency noted in the 1999 regional haze rulemaking, "EPA will work with the governments of Canada and Mexico to seek cooperative solutions on transboundary pollution problems." RHR, 64 Fed. Reg. at 35,736. In fact, EPA identified a process by which EPA would manage international contributions: (1) a State would submit a "technical demonstration" showing that "international emissions sources are responsible for a substantial increase in emissions affecting visibility conditions in any Class I area;" (2) EPA would determine if it agreed with the finding; and (3) "If EPA agrees with the State's finding, EPA will take appropriate action to address the international emissions through available mechanisms." *Id.* at 35,747. Texas met all of those requirements. Texas submitted modeling to EPA showing that Mexico's emissions were a significant contributor to visibility impairment in Big Bend and Guadalupe Mountains. *See* Texas SIP, at Section 10.6. EPA agrees that Mexico emissions are significant. *See* 79 Fed. Reg. at 74,843 ("large emission reductions from international sources" would be required to meet natural visibility goals). However, EPA has done nothing to meet its obligations to control emissions from Mexico or other international sources. Thus, EPA, and not Texas, must re-evaluate what it can do to help Texas meet its URP for Class I areas affected by international sources.

2. EPA's proposed FIP does no better at achieving the URP and visibility improvement than Texas' SIP yet imposes billions of dollars in costs.

It would be one thing for EPA to reject the Texas SIP for failing to meet the RPG if EPA has a plan that would lead to natural visibility more quickly. But EPA's plan does no better than the Texas SIP. Under the Texas SIP, the visibility impairment is projected to be at 16.36 dv on the 20% worst days at Guadalupe Mountains in 2018. *See* Figure 1 above. EPA's FIP purports to lower this number to 16.21 dv; a not perceptible 0.09 dv difference. *Id.* Both Texas and EPA would leave Guadalupe Mountains significantly above the URP.

EPA's FIP also does nothing to accelerate the final goal of natural visibility levels. EPA's FIP purports to reach natural visibility levels at Guadalupe Mountains only after 141 years and, at Big Bend, only after 173 years. 79 Fed. Reg. at 74,887, Table 44. It is absurd and clearly arbitrary for EPA to reject the Texas SIP for setting inadequate RPGs and then impose on the state and its sources costly control requirements that, at best, theoretically achieve the statutory goal 141 to 173 years in the future. In fact, unless EPA addresses the emissions from Mexico, EPA's theoretical, long-term improvements are not possible. The entire state of Texas could shut down and move away and visibility in these Class I areas would not improve.

F. EPA arbitrarily rejected Texas' natural conditions determination.

In developing its SIP, Texas undertook extensive, "refined" analysis of the role played by large particle particulate matter ("PM") on visibility conditions. Texas SIP, at ES-1. Both Big Bend and Guadalupe Mountains are in desert or semi-desert areas and are susceptible to high levels of wind-blown dust. To account for this in its analysis and modeling, Texas assumed that all of the large particle PM was naturally occurring dust. Texas SIP, at 11-1.

EPA proposes to disapprove Texas' calculation of natural visibility conditions, stating that "[a]nthropogenic sources of coarse mass and fine soil in the baseline period could have included emissions associated with paved and unpaved roads, agricultural activity, and construction activities."

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79 Fed. Reg. at 74,831. That is to say, some portion of the dust could come from human activity, although not from stationary sources. However, EPA did not undertake any analysis to determine whether, or to what extent, its assertion was correct. The mere possibility that other anthropogenic emissions “could have contributed” to the dust in these Class I areas is not a reasoned basis for rejecting TCEQ’s technical assumptions. Further, because of the extremely sparse populations near these Class I areas, the likelihood is that virtually none, or very little, of the dust is human generated.

Rather than deferring to Texas’ extensive analysis and conclusions about natural versus man-made dust in these remote locations, EPA inexplicably resorts to a default value for the Proposal, despite acknowledging that its default methodology is manifestly not suited to the West Texas desert. “[D]ust storms and other blown dust from deserts are a significant contributor to visibility impairment at the Texas Class I areas that may not be captured accurately by our default method.” *Id.* In addition, EPA noted that the impact of dust is less certain in Big Bend than at Guadalupe Mountains and noted that a different assumption “may be appropriate in estimating natural conditions there.” EPA, Technical Support Document for the Texas Regional Haze State Implementation Plans, at 41 (2014) (“Texas TSD”) (EPA Docket ID EPA-R06-OAR-2014-0754-0005). Nonetheless, EPA applied its default value to Guadalupe Mountains anyway.⁷

EPA should defer to Texas’ analysis of naturally occurring dust in the two Class I areas as it clearly is more representative and more accurate than EPA’s default value, which was developed for non-arid and non-desert areas. While using any of the methodologies will not allow Texas to meet the URP in 2018 or the natural visibility goal in 2064 due to the overwhelming impact of Mexico’s sources, assuming that all dust in the two Class I areas is naturally occurring would at least allow for realistic RPGs and a more appropriate natural visibility target.

G. EPA arbitrarily imposed new, more onerous State consultation requirements in its Proposal than it has applied to other SIP reviews.

As part of a State’s development of RPGs, a State “must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area.” 40 C.F.R. § 51.308(d)(1)(iv); *see also* 40 C.F.R. §§ 51.308(d)(3)(i)-(iii) (outlining consultation requirements for the long-term strategy). As EPA notes, all that is required for interstate consultation is that States work together and “take a hard look at what measures are necessary” to meet RPGs. 79 Fed. Reg. at 74,867.

It is undeniable that Texas and Oklahoma took the requisite “hard look” required as part of interstate consultation on regional haze. Most importantly, both states were active participants in the CENRAP regional planning process. Because CENRAP modeling showed Texas and Oklahoma sources affecting each state’s Class I areas, Texas and Oklahoma commenced a separate interstate consultation process. Indeed, Texas and Oklahoma provided substantial documentation of the numerous meetings, phone calls, and correspondence exchanged on the impacts of each State’s sources on Class I

⁷ In response to Federal Land Manager comments, Texas also had calculated natural visibility conditions assuming that 80% of coarse mass and soil should be attributed to natural sources. 79 Fed. Reg. at 74,831. EPA also fails to address why the 80% estimate is inappropriate.

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areas. *See* 79 Fed. Reg. at 74,865–67 (reviewing substantial consultation efforts); Texas SIP, at App. 4-2. Based on a request from Oklahoma as part of this consultation process, Texas even specifically agreed to allow Oklahoma an opportunity to comment on Texas' evaluation of Best Available Control Technology for new and modified sources. *See* 79 Fed. Reg. at 74,866.

Nonetheless, the Proposal disapproves of Oklahoma's and Texas' interstate consultation, and concludes that "Oklahoma did not have adequate information to reasonably establish its RPG for the Wichita Mountains, and, as explained below, should have requested that the TCEQ further investigate these sources." *Id.* at 74,867; *see also id.* at 74,857 (disapproving of Texas' consultation under long-term strategy requirements). The Proposal never details what information Oklahoma lacked in establishing its RPGs, nor did EPA provide an adequate explanation of how additional information would have changed Oklahoma's ultimate determination that additional controls on Texas sources would not move the Wichita Mountains perceptibly closer to its regional haze goals.

EPA is requiring significantly more from Oklahoma and Texas with respect to the consultation process than it has previously required via rule, guidance and other SIP approvals.⁸ In adopting its regional haze regulatory guidelines, EPA noted that, if States determine that no further controls are needed in a particular planning period, States must merely *document* "any consultations with other States in support of their conclusions." RHR, 64 Fed. Reg. at 35,721–22. Texas and Oklahoma did this. *See* Texas SIP, at App. 4-2.

EPA suggests that Texas and Oklahoma are simply relying on their participation in CENRAP to meet their consultation requirements. *See* 79 Fed. Reg. at 74,856 (noting that "[p]articipation in a regional planning organization does not automatically satisfy a state's obligation to" consult). This is inconsistent with the substantial record of consultation between the states. *Id.* at 74,865–67. Even EPA acknowledges that Texas went above and beyond the regional planning process that EPA deems sufficient for interstate consultation in the long-term strategy context. *Id.* at 74,857 ("In fact, the TCEQ went beyond the CENRAP analysis by contemplating additional controls, applying a lower cost effectiveness threshold and estimating the visibility benefit from the identified control set."). This was more than what is required in EPA regulations on consultation. 40 C.F.R. § 51.308(d)(iii) (noting that "The State may meet this requirement by relying on technical analyses developed by the regional planning organization and approved by all State participants.").

EPA also appears to be arbitrarily taking a harder line in reviewing Texas' and Oklahoma's consultation efforts than it has taken with other states. In other recent regional haze SIP actions, EPA concluded that interstate consultation requirements were met, even though there was substantially less consultation than the discussions between Oklahoma and Texas:

- In Michigan, EPA found adequate consultation even when Michigan did not offer additional controls for a Class I area not meeting its glide path until 2209. *See* Proposed Michigan SIP Approval, 77 Fed. Reg. at 46,917 ("By coordinating with the MRPO and other RPOs, Michigan has worked to ensure that it achieves its fair share of overall emission reductions").

⁸ Although EPA stated in 2006 that it planned to issue more specific protocols for state consultation, EPA never released such guidance. *See* EPA, Additional Regional Haze Questions, at 11 (2006).

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- In Arkansas, EPA concluded that Arkansas met consultation requirements based on three calls with states and concurrence in the conclusion that controls in other states are not necessary. Proposed Arkansas SIP Approval/Disapproval, 76 Fed. Reg. 64,186, 64,196 (Oct. 17, 2011).
- In Kentucky, EPA found that Kentucky adequately addressed the consultation requirements by determining that sources were meeting more stringent requirements than regional MANE-VU recommendations. Kentucky SIP Approval, 76 Fed. Reg. at 78,213.

EPA cannot make inconsistent conclusions on the adequacy of the consultation process between Oklahoma and Texas as compared to other States without any reference to its rules, guidance and prior SIP approvals.

III. EPA's Proposal Contravenes the Clean Air Act and its Own Regulations.

A. EPA cannot treat Texas disparately from other states in promulgating a regional haze FIP.

The disparate treatment of Texas under the Proposal runs afoul of EPA's mandate for fair and consistent treatment of states under the CAA. EPA has issued "Regional Consistency" regulations to "[a]ssure fair and uniform application by all Regional Offices of the criteria, procedures, and policies employed in implementing and enforcing the act." 40 C.F.R. § 56.3(a); *see National Environmental Development Association's Clean Air Project v. EPA*, 752 F.3d 999 (D.C. Cir. 2014) (finding that EPA violated its Regional Consistency rules by applying a different interpretation of a single stationary source in jurisdictions outside of the Sixth Circuit). EPA, specifically regional offices such as the Region 6 office that promulgated the Texas FIP, have an obligation to ensure that their actions "are consistent as reasonably possible with the activities of other Regional Offices." 40 C.F.R. § 56.5. EPA's Region 6 has contravened EPA's regional consistency rules by treating Texas differently than other states in implementing the RHR, and EPA more broadly has failed to correct any regional inconsistencies in regional haze FIPs. 40 C.F.R. § 56.3(b) (EPA must "[p]rovide mechanisms for identifying and correcting inconsistencies by standardizing criteria, procedures, and policies being employed by Regional Office employees in implementing and enforcing the act."). EPA is "not free to ignore or violate its regulations while they remain in effect." *National Environmental Development Association's Clean Air Project*, 752 F.3d, at 1011 (citing *U.S. Lines, Inc. v. Federal Maritime Commission*, 584 F.2d 519, 526 n.20 (D.C. Cir. 1978)).

EPA's singling out of Texas for different treatment under the RHR also is in conflict with the "fundamental principle of equal sovereignty" among the States. *See Shelby County, Ala. v. Holder*, 570 U.S. ___, 133 S. Ct. 2612, 2616 (2013) (holding the Voting Rights Act preclearance requirement for particular jurisdictions unconstitutional). The U.S. Supreme Court has held that states must be treated equally under federal law unless there is "a showing that a statute's disparate geographic coverage is sufficiently related to the problem that it targets." *Id.* at 2616-17 (citing *Northwest Austin Municipal Util. Dist. No. One v. Holder*, 557 U.S. 193, 203 (2009)). EPA has not identified a provision in the Clean Air Act that specifies a particular regional haze issue in Texas justifying the disparate treatment of Texas in its FIP. Furthermore, given the "regional" nature of regional haze, it is arbitrary and capricious to single out a particular State for more stringent treatment.

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B. EPA appears to be attempting to dictate which appellate court should have jurisdiction over any appeal of the final FIP.

EPA inappropriately suggests that the Proposal is unique in its “nationwide scope and effect,” which would site jurisdiction over any appeals of the Proposal in the U.S. Court of Appeals for the D.C. Circuit (“D.C. Circuit”). See 79 Fed. Reg. at 74,888. This is a blatant and improper attempt to override Congress’ mandate in the CAA that rules with only local or regional effect should be heard in the United States Court of Appeals for the appropriate circuit and not in the D.C. Circuit. 42 U.S.C. § 7607(b)(1). EPA’s final Regional Haze FIP for Texas will determine what additional controls to impose on specific Texas sources to achieve reasonable progress toward natural visibility goals for Class I areas located in Texas and Oklahoma. It is an action of inherently local or regional effect that must be reviewed in the U.S. Court of Appeals for the Fifth Circuit.

EPA has proposed interpretations in this Proposal that might have applicability to other state regional haze FIPs. However, that does not make the Proposal of “nationwide scope and effect.” EPA also has proposed interpretations in other state regional haze FIPs that might have applicability to Texas, but EPA has never claimed that those FIPs were of nationwide scope and effect. In fact, most recently, on April 8, EPA proposed a regional haze FIP for Arkansas. 80 Fed. Reg. 18,944 (Apr. 8, 2015). Nowhere in the proposed Arkansas FIP does EPA suggest that its interpretations therein are of nationwide scope and effect. Instead, the proposed Arkansas FIP and other prior regional haze FIPs have been treated as having “only local or regional effect.” Indeed, other FIP challenges have already been heard in other circuit courts of appeals for the appropriate region and not in the D.C. Circuit. See *Wyoming v. EPA*, No. 14-9529 (10th Cir.) (reviewing Wyoming SIP Disapproval/FIP); *North Dakota v. EPA*, 730 F.3d 750 (8th Cir. 2013) (reviewing North Dakota SIP Disapproval/FIP); *Oklahoma v. EPA*, 723 F.3d 1201, 1213 n.7 (10th Cir. 2013) (reviewing Oklahoma SIP Disapproval/FIP). The final FIP for Texas should clearly state that any appeals of the FIP should be heard in the U.S. Court of Appeals for the Fifth Circuit.

IV. EPA’s Proposal to Require Installation of Scrubbers at Tolk Would Produce Miniscule Visibility Benefits.

Many of the same flaws in EPA’s analysis of Texas’ SIP also exist in its promulgation of a FIP to replace Texas’ regional haze program. To avoid repetition, Xcel Energy’s comments on the Proposal’s analysis and partial disapproval of Texas’ SIP are incorporated by reference in regard to the FIP.

A. EPA’s 0.3% contribution threshold for the four-factor reasonable progress evaluation is arbitrary.

One of the most important errors that EPA made in the Proposal is its selection of a “natural break” in the visibility impact data that EPA used to require controls on some sources and not on others. FIP TSD, at A-49. EPA’s analysis and its selection of a “natural break” threshold are seriously flawed. As discussed above, EPA departed from its own guidance and approach to regional haze rules across the country. Instead of relying on deciview impacts to identify sources of visibility impairment and to estimate visibility benefits from controls, EPA resorted to the use of light extinction. This is, on its face, problematic. However, EPA then utilized its analysis of light extinction caused by various sources as a way to decide which sources should be controlled and which could wait until the next planning period.

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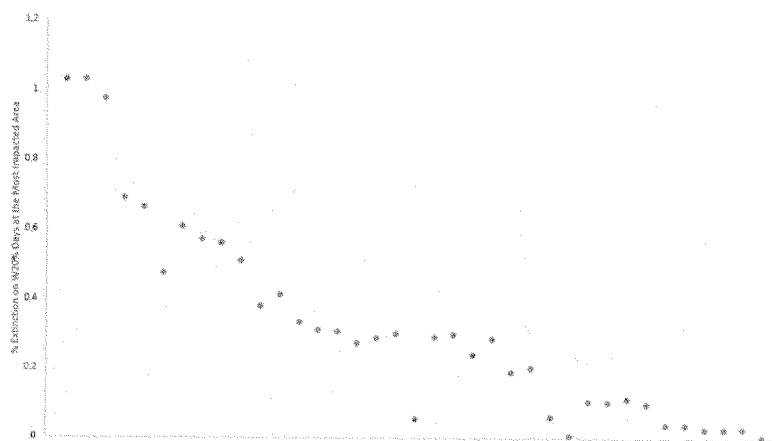
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Specifically, EPA plotted the light extinction data for 19 facilities (38 emission units) obtained from CAMx modeling to evaluate visibility impacts.⁹ EPA calculated the percent of extinction for the average impacts on the worst 20% (W20%) days at the most impacted Class I area for each emission unit using the PM source apportionment tool ("PSAT"). According to the FIP TSD, EPA then reviewed these adjusted values and identified "natural break points that indicated a significant drop-off in impacts" that would allow them to "select a natural subset of the largest impacting sources" to be included in their reasonable progress analysis. FIP TSD, at A-49. EPA identified natural break points around 1%, 0.5%, and 0.3%. FIP TSD, at A-49. EPA provided no mathematical justification in the FIP TSD to support its assertion that these values represent the natural breaks for the sample population. The selection of the 0.3% light extinction threshold seems to have been made by "eyeballing" the data instead of performing a statistical analysis.

The following scatter plot in Figure 4 shows the percent extinction for the average impacts on the W20% days at the most impacted area for the 38 emission units.

Figure 4: Scatter Plot of % Extinction on W20% Days at the Most Impacted Area



Based on the above plot, there is no obvious break in the data at 0.3% light extinction.

To identify natural breaks in the data using more scientific and mathematical methods, Xcel Energy had the data imported into the ESRI ArcGIS software, excluding zeroes. In ArcGIS, there are multiple classification options that can be selected. The current sample population data, "percent of extinction for the average impacts on the worst 20% (W20%) days at the most impacted Class I area for

⁹ The percent extinction values obtained from the CAMx modeling were adjusted to reflect 2008-2012 average emissions. FIP TSD, at A-52 (Table A.4-4).

Jenks' optimization is a method of statistical data classification that partitions data into classes using an algorithm that calculates groupings of data values based on the data distribution. Jenks' optimization seeks to reduce variance within groups and maximize variance between groups. Jenks' optimization uses an iterative method to calculate multiple breaks in the datasets to determine the natural break with the smallest variance. Class breaks are identified that best group similar values and that maximize the differences between classes. For the purpose of this analysis, two classification options were selected to define the natural breaks to determine which sources should be included in the four-factor reasonable progress analysis and which sources should be excluded.

¹⁰ The other classification schemes provided in ArcGIS are not appropriate for the data. The Equal Interval methodology calculates the interval based on the equal number of values in each class irrespective of the variance in the data. The calculated value of the equal interval is 0.51%. The Quantile method classification applies to linear data sets and is not applicable here because the current dataset is a composite of random values derived as a percent extinction at the most impacted Class I area and, therefore, is a spatially and temporally non-linear dataset. The Standard Deviation classification determines numbers of classes to keep the variance between the mean values of the classes to less than one standard deviation. The variance between the current set of values is so large that the Standard Deviation method cannot be applied without classifying the data into a minimum of four classes of sources. Since the purpose of this analysis is to classify the data into two classes, this methodology is not appropriate. Nonetheless, even if one of these classifications were used for the determination of a reasonable progress analysis threshold, none of the methodologies calculate a natural break at 0.3%.

As shown in Figure 5 above, Jenks' optimization, a statistically sound method that is appropriate to the dataset, would set the natural break for including sources in the group subject to the reasonable progress four-factor analysis at 0.41%. EPA's utilization of a threshold of 0.3% extinction to determine which units should be included in a reasonable progress four-factor analysis is unjustified and its selection appears to be subjective. It results in an arbitrary threshold specific to this data set that cannot be applied or replicated across other reasonable progress analyses.

EPA should set the threshold at 0.41% for purposes of determining which sources should be evaluated for controls under the four-factor reasonable progress analysis. This would put Tolk in the group of sources *excluded* from the consideration of controls.

B. The predicted improvement would produce no discernible visibility benefit.

In the FIP TSD, EPA has estimated a total deciview improvement of 0.763 over the average natural conditions clean background for the Guadalupe Mountains National Park based on CAMx modeling. FIP TSD, at A-76, Table A.6-5 - Net benefit of Proposed Controls on 2018 Visibility Projections. This estimated deciview improvement is the cumulative improvement that would result from EPA's proposed controls, consisting of scrubber upgrades on seven units and scrubber retrofits for seven units. This analysis is the main reason the Tolk units are proposed to be controlled in the proposed FIP. EPA is proposing to require facilities in Texas to spend billions of dollars through the addition and/or upgrade of control devices when the collective visibility improvement from such facilities will not be perceptible.

The deciview scale was selected by EPA as the measure of visibility improvement in the RHR specifically because by definition each deciview reflects "perceptible changes" in visibility. *See* Proposed RHR, 62 Fed. Reg. 41,138, 41,145 (July 31, 1997) ("A one deciview change in haziness is a small but noticeable change in haziness under most circumstances when viewing scenes in mandatory Class I Federal areas."). Accordingly, *by EPA's own standard*, a total deciview improvement at the Guadalupe Mountains of 0.763 dv from the installation of controls at the selected Texas facilities would not be perceptible to the human eye. Further, studies have since demonstrated that not only is the deciview scale not uniform in perception over a wide range of visibility conditions, but a 1-deciview change in visibility is not even perceptible to the human eye for observation. *See* Appendix A, "Just-Noticeable Differences in Atmospheric Haze," Ronald C. Henry, Department of Civil and Environmental Engineering, University of Southern California, Los Angeles, Air & Waste Manage. Assoc. (2002).

In addition, observations and air modeling for the haziest days suggest that there is not a clear downward or upward trend in regional haze for the Guadalupe Mountains, Big Bend, or the Wichita Mountains Class I areas. *See* Appendix B. For the Guadalupe Mountains, the clearest days show a downward trend of -0.09 dv/yr (reduction). Overall, there is variation of ± 2 to 3 deciviews over the last 21 years. Therefore, EPA's estimated deciview improvement for average natural conditions at Guadalupe Mountains associated with the addition of dry scrubbers on the Tolk units (0.182), while clearly imperceptible, also is insignificant compared to the natural variation in background regional haze over the last 20 years. *See* 79 Fed. Reg. at 74,882, Table 36.

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C. The margin of error in different CAMx modeling compilations was not considered.

Model performance varies as a function of many factors including, but not limited to, the following: pollutant, time of day, time of year, accuracy of input data (e.g., emissions inventories, meteorological data, etc.), selection of model options/parameterizations, resolution, and geographical location. Studies have shown that photochemical models tend to under-predict sulfate concentrations in general, while for nitrate concentrations they tend to over-predict in the winter and under-predict in the summer. See Appendix C, "Compilation and Interpretation of Photochemical Model Performance Statistics," Heather Simon, et. al., U.S. EPA, Atmospheric Environment (2012). Performance of photochemical models also appears to be significantly better in the Eastern U.S. than the Western U.S. (west of the Rocky Mountains). Something as seemingly insignificant as the choice of compiler can lead to slight differences in modeled results. When utilizing modeling for regulatory purposes, the bias and error should be reported and taken into consideration when proposing controls. From a review of the EPA provided documentation, these items were not considered and instead a definitive result was predicted.

EPA also arbitrarily used CAMx modeling to model transport of haze from sources despite significant known limitations with CAMx involving over-prediction of emissions at longer distances, and even though EPA has consistently promoted the use of CALPUFF. See, DOCUMENTATION OF THE EVALUATION OF CALPUFF AND OTHER LONG RANGE TRANSPORT MODELS USING TRACER FIELD EXPERIMENT DATA, ENVIRON INTERNATIONAL CORPORATION, EPA Contract No. EP-D-07-102, Work Assignment No. 4-06, Figure 6-13 (2012), available at http://www.epa.gov/ttn/scram/reports/EPA-454_R-12-003.pdf.

V. EPA's Proposal Significantly Underestimates the Cost of Installation of Scrubbers at Tolk.

In evaluating control costs for Tolk, EPA failed to consider site-specific factors applicable to Tolk, despite an express requirement to do so under the RPG rules. See 40 C.F.R. § 51.308(d)(1)(i)(A) (requiring consideration of "costs of compliance, the time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected sources"); see also 79 Fed. Reg. at 74,874 n. 292 (noting that Tolk was the "one exception" "merit[ing] special consideration of the energy and non-air quality environmental impacts of compliance"). This is particularly true regarding water consumption at Tolk. EPA wrongly assumes that Tolk currently has available groundwater that would allow it to operate scrubbers. EPA also fails to consider the impact and costs associated with managing and disposing of scrubber and ash residue in light of Tolk's current 100% beneficial reuse of ash and the requirements that apply to a new landfill under the final Coal Combustion Residue ("CCR") rule, 80 Fed. Reg. 21,302 (Apr. 17, 2015).¹¹ Finally, EPA made an unreasonable assumption regarding the likely and appropriate amortization period for the scrubbers. All of these omissions result in a significant underestimation of costs.

A. Water availability and cost were not appropriately considered.

In the FIP TSD, EPA recognizes that water scarcity in the region around the Tolk facility is a serious concern for the implementation of a wet scrubber. FIP TSD, at 8, 30. However, EPA fails to

¹¹ At least in part due to these "special" considerations at Tolk, EPA did appropriately determine that any installation of controls at Tolk stemming from RPGs should allow for an implementation period of five years.

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recognize that the issue is just as problematic for a dry scrubber. The qualifier "dry" in dry scrubber is the difference in how the control device utilizes the sorbent material for removal. It does not mean that the control device operates without water. A dry scrubber still uses water to hydrate the removal media (generally lime) to operate properly. A wet scrubber uses water sprays and a lime sludge recycle to effectuate removal. Dry scrubbers may require approximately 50% percent less water to operate than wet scrubbers, but they still use a significant amount of water.

EPA stated in a meeting with Xcel Energy on February 4, 2015, in the EPA Region 6 office in Dallas, Texas that use of a dry scrubber requires 3% to 5% more water than the same plant without a dry scrubber. Xcel Energy could not find any support for this statement from EPA but, even if true, it is not true in the case of Tolk. Due to water scarcity in the region, Xcel Energy has undertaken aggressive measures to minimize and reuse the limited water that is available from the aquifer. All of Tolk's water comes from the underground Ogallala aquifer, the same aquifer used by the farmers and communities in the panhandle of Texas. To conserve available water, Tolk installed additional clarifying capacity to enhance the current treatment facilities at Tolk, which allows the cooling tower blowdown from its neighboring Xcel Energy facility to be sent to Tolk, recycled and reused. This saves billions of gallons of fresh water by maximizing the use of the existing water.

In addition, the plant monitors water treatment continuously to maximize the water quality on the supply side to the cooling cycle so that maximum cycles of concentration can be utilized to limit the amount of blowdown water on the discharge side of the cooling cycle. Basically, Tolk "reuses" the water 20 to 25 times before a solubility limit is reached. To maintain the proper chemistry, some of the cooling water is blowdown (average of 300-350 GPM) to evaporation ponds. This maximum use of existing water means the total plant water "makeup" (water required for all of plant operations including cooling tower evaporation, boiler water, auxiliary cooling, washdowns, etc.) is much less than other plants that do not maximize water usage. Even though a dry scrubber sorbent preparation system could reuse part of the blowdown as makeup water, the plant would still require additional fresh makeup water for the dry scrubber process. As a result, installing dry scrubbers at Tolk would increase the makeup water intake requirements for the complex by approximately 9-12%.

These increased water requirements are highly significant in light of the critical lack of water in the region. This additional amount of water is simply not available at the Tolk site. Xcel Energy estimates adding dry scrubbers would require approximately 1,165 acre/feet per year of water availability. Over 30 years, as amortized by EPA for this Proposal, additional water requirements would be approximately 36,000 acre-feet for operation of the scrubbers. To obtain the additional amount of water necessary to support the operation of dry scrubbers, SPS would attempt to purchase significant water rights from existing farmers along with a gathering system or look at other costly alternatives. Based on the historical cost of water rights in the area, this is an additional cost of approximately \$40 million that was not included in EPA's cost estimates. This is also assuming that these water rights are available. The acquisition of these water rights may require the purchase of neighboring agricultural businesses, which could further increase acquisition costs. These costs for additional water rights, infrastructure or alternatives are not included in EPA's overall cost estimate for dry scrubber installation. If these costs were added, they would greatly increase the estimated cost of dry scrubbers at Tolk and the associated cost per ton of emissions reduction.

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B. Baghouse- and waste-related costs were not adequately considered.

Tolk beneficially re-uses 100% of its fly ash. In the Technical Support Document for the Cost of Controls Calculations for the Texas Regional Haze Federal Implementation Plan ("Cost TSD"), EPA recognizes that it is important to retain consistent fly ash specifications to be able to beneficially re-use fly ash. Cost TSD, at 9 (2014) (EPA Docket ID EPA-R06-OAR-2014-0754-0008). Tolk currently has a baghouse to control particulate matter emissions. If dry scrubbers were to be installed at Tolk, the plant would not be able to beneficially re-use 100% of its flyash, which would result in two major issues that EPA failed to consider. The first is the potential need for additional baghouses and the second is the need for a landfill.

There are two options for a scrubber to be placed in the flue gas stream. Option A would locate the scrubber upstream of the existing baghouse and Option B would locate the scrubber downstream of the existing baghouse but it also would require an additional baghouse to be built downstream of the scrubber.

Option A would end the re-use of the existing fly ash as all of the fly ash would be contaminated with scrubber waste and, thus, would no longer be suitable for re-use. Option A is lower in capital cost and aligns better with EPA's current estimate, which does not factor in additional baghouse costs. The loss of revenue from the sales of the fly ash (approximately \$2 million annually), additional O&M for handling of fly ash and bottom ash (currently netted out of fly ash revenues) and increased bag replacements would have to be included in the total cost estimates for SO₂ removal. It is Xcel Energy's opinion at this time that Option A has the most economic benefit of the two options even though EPA's cost estimates are artificially low.

Option B would allow for the continued re-use of the existing fly ash, but would require substantial additional capital cost estimated at \$45-62 million for Tolk for a post scrubber baghouse. This cost estimate is based on historical studies conducted by Burns & McDonnell Engineering Company, Inc. ("B&M") for Xcel Energy's Harrington Generating Station, where B&M estimated \$38 million for a new baghouse. Harrington's coal-fired units are smaller in size than Tolk's. Accordingly, for Tolk, Xcel Energy increased the \$38 million estimate by 37% to address the ratio between the size of the Tolk units and the Harrington units. Xcel Energy then scaled down the Tolk estimate by 10% as the secondary baghouse would be smaller than a full particulate baghouse but still would require a high cloth to air stream number. Finally, Xcel Energy increased the Tolk estimate by 12% for overhead, engineering and management and 15% for contingency for unknowns.

EPA erroneously assumed this post scrubber baghouse was in place and would allow Tolk to continue the re-use of ash. This is not the case for Tolk. It is Xcel Energy's opinion that the fly ash revenue stream and reduced O&M expense do not cover the additional cost of the baghouse and this option is not economically viable. If Option B were chosen by EPA, then EPA would need to add substantial capital (with additional O&M) to its cost estimates for emissions removal.

Either scrubber arrangement option would require a new landfill at Tolk, a cost that EPA also has not factored into its estimates. Tolk currently generates approximately 170,000 tons of fly ash on an annual basis. The addition of a scrubber would generate approximately 80,000 tons of scrubber waste. There is variability to this number as some of the existing ash is used in start-up and becomes part of the waste.

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A new landfill would vary in size and capacity depending on which option was chosen for the baghouse arrangement. If Option A were selected, then the total of the ash and scrubber waste would need to be landfilled annually. If Option B were selected, then only the scrubber waste would be landfilled annually. Under Option A, Xcel Energy estimates the cost for the construction of a landfill for this ash would be an initial capital investment of \$10 million with ongoing capital expenses every five years of approximately \$5 million for new cell construction. See Appendix D, excerpt from Harrington Generating Station Units 1, 2 & 3 and Tolk Generating Station Units 1 & 2 Phase I Air Quality Control Study Engineering Services Project Study Prepared for Xcel Energy, B&M (Nov. 2011). B&M estimated the initial cost of a landfill to be approximately \$1.1 to \$5.2 million. There also are ongoing capital costs for the addition of a new cell and capping an old cell every five years at a cost of approximately \$1.1 to \$5.2 million. After reviewing these costs, Xcel Energy utilized past internal experience for site work for ponds, estimates for using a lime landfill with minimal liner and monitoring wells and concluded that the B&M costs were understated for the initial landfill as they only considered the first cell opening and not the development of the whole site. Therefore, Xcel Energy estimates that initial landfill development (site selection and first five-year cell) would be approximately \$10 million and then \$5 million every five years for ongoing cell development. These costs do not include the ongoing operational costs associated with ash hauling placement and compaction in the landfill. The current EPA estimate fails to include these additional capital costs. Additionally, the new CCR rule will impose significant new requirements for the construction of an ash landfill. These requirements include prescribed composite liners, leachate collection, ground water monitoring and a host of other operating costs that were not included in EPA's cost estimates. There also are O&M costs associated with ash handling and placement in a new landfill that were not factored into EPA's cost analysis. See Cost TSD, at 6.

Regardless of the arrangement of a scrubber in the flue gas stream, EPA failed to include all of the costs necessary to manage and landfill the wastes created by the scrubber, which artificially lowers EPA's estimated cost per ton removed. EPA also failed to properly analyze the cost benefit ratio of discontinuing the re-use of the fly ash on the environment by forcing the creation of a landfill that would be attendant to the addition of scrubbers at Tolk.

C. EPA did not adequately consider lower-cost options for compliance, such as dry sorbent injection.

In the Proposal, EPA too quickly eliminated the lower-cost option of dry sorbent injection ("DSI") at Tolk without sufficient evidence for doing so. In the Cost TSD, EPA says, "we lack the site specific information, which we believe requires an individual performance test, in order to be able to accurately determine the maximum SO₂ removal efficiency for the individual units" and EPA goes on to note that such site-specific information has already shown infeasibility at more than one unit (i.e., Luminant's Big Brown and Monticello units). Cost TSD, at 7. Yet EPA still evaluates "each unit at its maximum recommended DSI performance level[. . .] . . . 90% SO₂ removal..." Cost TSD, at 8. Without the site-specific information that EPA admits it needs and does not have, it is arbitrary to select the maximum performance level for each unit under consideration. This lack of information does not fully consider all appropriate options for controls at a facility. In turn, EPA has failed to properly perform a four-factor analysis because EPA arbitrarily and unreasonably failed to consider alternative, less expensive controls such as DSI, or to compare the incremental costs and environmental benefits associated with such controls and scrubbers at particular units. EPA has done this comparative cost-

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incremental analysis for source-specific RPG controls in other regional haze SIPs/FIPs. *See* Proposed North Dakota SIP Approval/Disapproval, 76 Fed. Reg. at 58,631 (analyzing RPGs for a source in the North Dakota FIP using incremental cost effectiveness analyses for various controls of NO_x emissions).

D. EPA failed to consider non-air environmental impacts.

EPA's four-factor reasonable progress analysis requires that potential controls be evaluated for their non-air environmental impacts. As discussed above, the installation of dry scrubbers at Tolk would require a significant increase in the use of precious water resources and would result in the landfilling of all of Tolk's fly ash. EPA failed to give any consideration to the environmental impact of increasing water usage in this extremely arid region. The Ogallala aquifer is the main source of water for all of the farmers, residences and industrial activities in this area. The Ogallala aquifer is famously over-utilized and stressed. Operating dry scrubbers at Tolk would increase its water demand by 9% - 12%. EPA gave no consideration to the impact of requiring dry scrubbers on the extremely scarce water resources on this part of West Texas.

Similarly, EPA failed to weigh the non-air environmental impact of requiring Tolk to begin landfilling the fly ash from its operations. Currently, Tolk beneficially utilizes 100% of its fly ash. Installing dry scrubbers would require SPS to cease selling its fly ash and, instead, construct extensive landfills to dispose of the scrubber residue. This is not just a significant cost, but also an unnecessary burden on the land and would result in additional environmental and management risks associated with such landfills.

E. EPA's amortization timeframe is inappropriate.

EPA's amortization period assumption of 30 years for the required controls at Tolk is inappropriate and leads to underestimated costs of reduction per ton of emissions for these controls. Typically, in public utility commission ratemaking processes, utilities seek and receive cost recovery for 20 years of equipment life for emissions controls. Further, emissions retrofit equipment does not last for 30 years without substantial new investments, often in the face of increasingly stringent emissions requirements that may require upgrades. The 30-year amortization period also is a questionable assumption for emissions units that will be approaching 40 years old by the time the Proposal requires the scrubbers in 2020.¹² Finally, EPA has previously accepted a 20-year amortization period for the life of these types of controls. EPA, Air Pollution Cost Control Manual, at 3-33 (2002) (stating amortization over 20-30 years is appropriate); Wyoming Regional Haze FIP, 79 Fed. Reg. 5032, 5064-65 (Jan. 30, 2014) (using a 20-year amortization period for the Dave Johnson and Naughton plants); Arizona FIP, 79 Fed. Reg. 52,240, 52,459 (Sept. 3, 2014) (assuming a 20-year amortization period); Montana FIP, 77 Fed. Reg. 57,864, 57,882 (Sept. 18, 2012) (using a 20-year amortization period).

Figure 6 below shows that a more appropriate 20-year amortization period for the scrubbers would increase the cost per ton of emissions controlled by 9%. The table below in Figure 6 utilizes the EPA estimates in the Cost TSD, but only considers the amortization factor and does NOT include the additional impacts of the costs to obtain water or to construct and operate a new landfill.

¹² Tolk Unit 1 will have been in operation for 38 years in 2020, and Tolk Unit 2 for 35 years

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Figure 6: Cost Estimate for Tolk Units 1 and 2 with Revised Amortization and Costs

Tolk Unit	Cost per Ton - 30 Yr	Cost per Ton - 20 Yr	% Increase over EPA Estimate
Tolk Unit 1	\$3,178	\$3,505	9%
Tolk Unit 2	\$2,998	\$3,310	9%

F. The highest cost controls are proposed for Tolk for the least amount of visibility improvement.

Even using EPA's costs estimates for installation of dry scrubbers at Tolk, the Proposal would impose on Tolk the highest cost of the scrubber retrofits contemplated for the lowest visibility benefit modeled for any unit for which EPA proposes controls. The Tolk units were modeled at barely over EPA's declared 0.3% threshold for light extinction, and yet would have the most expensive scrubber installation. Other units for which EPA proposes controls under a 0.5% modeled light extinction impact are upgrades to existing scrubbers, which are many times less expensive than building entirely new scrubbers. In addition, EPA did not propose controls for units which modeled barely under EPA's chosen screening level, even though much less costly scrubber upgrades were an available option. These points are illustrated in the chart in Appendix E.

Given the extremely low modeled deciview impact and the high cost of installing entirely new scrubbers, EPA's proposal to require scrubbers on Tolk cannot be considered "reasonable" and will not result in any perceptible "progress." The emission reductions achieved would be simply overwhelmed by international contributions and natural dust, and diluted by Tolk's substantial distance (over 330 km) well northeast of the Guadalupe Mountains National Park. Additionally, as discussed above, given that EPA underestimated the costs of dry scrubbers for Tolk, the Proposal is even more unreasonable than the chart in Appendix E demonstrates.

VI. Conclusion

For the foregoing reasons, Xcel Energy respectfully requests that EPA adopt a final rule that approves the Texas Regional Haze SIP's reasonable progress analysis and conclusions, or at least concludes that installation of dry scrubbers at Tolk should not be required in light of the extremely low modeled deciview benefit and the high cost of installing entirely new scrubbers.

VII. APPENDICES

APPENDIX A

TECHNICAL PAPER

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Just-Noticeable Differences in Atmospheric Haze

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ABSTRACT

This article examines the only available experimental data taken in the natural environment on the ability of an observer to perceive small, incremental changes in the colorfulness of objects seen through atmospheric haze and estimates an appropriate just-noticeable difference (JND) from these data. This experimentally determined threshold of perception is compared to changes in the deciview scale. Based on these experimental results, the deciview scale is found to not be uniform over a wide range of visibility conditions, as has been previously claimed. In addition, a 1-deciview change never produces a perceptible change in haze, as defined by a 95% probability of producing a measurable change in the colorfulness of an object seen through the haze.

INTRODUCTION

Section 169A of the Clean Air Act sets a national goal of protecting visibility in national parks and other pristine areas. Under regulations promulgated in 1980, the U.S. Environmental Protection Agency (EPA) has taken specific regulatory action to protect visibility in the Grand Canyon National Park by reducing emissions of sulfur dioxide from the Navajo Electric Generating Station near the eastern end of the Grand Canyon and from the Mohave Power Plant at the western end. However, current concerns about visibility degradation stem from regional haze that is difficult or impossible to attribute to individual sources of air pollution. This issue is addressed by regional haze regulations that set a goal of making reasonable

progress toward improving regional visibility in five-year increments, leading to the attainment of "natural conditions" by 2064.¹ Progress is to be measured by an innovative visibility metric for regulatory purposes known as the deciview,² used instead of visual range or other visibility metrics because it "expresses uniform changes in haziness in terms of common increments across the entire range of visibility conditions, from pristine to extremely hazy conditions."¹ One goal of this article is to assess this and other claims about the deciview scale in light of actual measurements of the perception of haziness. Since the deciview scale is meant to quantify small, just-noticeable differences (JNDs) in visibility, a review of the basic concepts of thresholds and JNDs is given.

Perceptual Threshold Concepts

For all the senses, thresholds are necessary—otherwise we would be constantly distracted by small, inconsequential changes in the environment. A background of random noise, some from the environment and some produced inside our own sensory organs, would make it next to impossible to form a stable view of the world. Our vision would be like the grainy, speckled images produced by night vision cameras. On a more basic scientific level, the study of thresholds of the senses has led to a deeper understanding of sensory physiology and how our vision and other senses function. For this reason, virtually all studies of thresholds of vision have been carried out under controlled laboratory conditions.

Since laboratory conditions seldom mimic the natural environment, thresholds so determined are generally not useful in predicting perception in the complex natural world. As an example of the drastic effect that experimental conditions can have on perception, consider an experiment to determine the ability of an observer to perceive the difference in the length of two strings—or to put it another way, to determine the threshold for perception of the difference in the length of two strings, or the JND. If the two strings are widely separated when presented to the observer, the threshold will be much greater than if the two strings are presented side by side. The visual equivalent of this is the use of a split image to determine the ability to distinguish color. If two colors are seen as two halves of a disk, the JND is very small, but if one

IMPLICATIONS

Current regulations use the deciview to quantify a perceptible change in regional haze. Based on the results of this article, changes in atmospheric extinction required to meet regional haze regulations calculated using deciviews would probably be too small, sometimes much too small. In addition, these regulations require that progress be assessed over five-year intervals. In this way, the burden of reducing emissions is spread evenly over many years. However, since deciviews are not uniform in perception, it may be that the actual improvement in visibility will not be uniform.

color is presented as a full disk, followed a few seconds later by the other color, the JND will be much larger. The topic of the background on which the colors are seen is also important (e.g., if it is black or a complex scene). In general, many conditions influence thresholds; for this reason, the results of laboratory experiments should be applied with great caution to the natural environment. Thus, this article will report and analyze data taken in a unique experiment in the natural environment with a goal of determining a JND in atmospheric haze.

In the above discussion, the terms "threshold" and "JND" have been freely used, but not defined. The naïve definition of a threshold or JND is clear: It is the smallest amount, or change in, a physical stimulus that is detectable. Ideally, a 1-JND change in a stimulus such as contrast or color would always result in the observer seeing a change, and anything less would not. Of course, the senses do not work in this simple on-off manner. In actuality, as the change in the physical stimulus increases, the probability that the observer will detect the change increases as well. Thus, thresholds and JNDs have always been defined by a probability of detection. Furthermore, the sensitivity of people's senses varies from person to person and during a person's life. Even if each person had a single, idealized threshold, the response of the general population would be best described by a probability of detection.

Repeated matching by the method of adjustments is one of the oldest methods of determining a JND. Falmagne² described this and other methods to quantify perception. Briefly, the observer is shown a target color and a variable test color and is asked to adjust the test color until it matches the target. Taking random starting points, the matching procedure is repeated as often as is practical. Since the observer has judged the matching color to be the same as the target color, the variability in the matches is a measure of a JND around the target. The standard deviation of the matches is one measure of this variability that is often used; another is the difference between the 75th and the 25th percentile of the match distribution. The method of adjustments has been replaced in laboratory studies by methods that give less control to the observer and more to the researcher and therefore improve the reproducibility of the results (unfortunately, these methods are impractical for field studies). However, JNDs are still defined by some measure related to the probability of detection. The final determination of the value of a JND or threshold is really dependent on how the measurements are made and how the data are interpreted. For the experimental data used in this article, the method of adjustments was used and a JND related to the standard deviation of repeated matches was defined.

Atmospheric Visibility Concepts

In the classical theory of atmospheric visibility, the threshold of contrast perception, that is, the threshold for perception of a large, dark object on the horizon, is assumed to be 2%.⁴ This number is somewhat arbitrary. The Federal Aviation Administration (FAA) has taken the more conservative value of 5.5% as a contrast threshold for the definition of visual range, presumably because approaching aircraft seen from a cockpit are usually neither large nor dark. The common formula for visual range, using the 2% threshold, is

$$V_R = \frac{-\ln(0.02)}{b_{ext}} = \frac{3.9}{b_{ext}} \quad (1)$$

where b_{at} is the extinction coefficient of the atmosphere, which is assumed to be homogeneous. The extinction coefficient in the denominator of the formula can be thought of as the fraction of light that is lost as it traverses 1 m of air. For completely clear air, b_{at} has a value of about $10 \times 10^{-6} \text{ m}^{-1}$ or 10 Mm^{-1} , or a visual range of about 390 km. More typically, particles in the air usually increase the extinction coefficient to $150\text{--}300 \text{ Mm}^{-1}$ or more. Typical visual ranges are about 10 km in the eastern United States and 50 km or more in the western United States. Closely related to b_{at} and visual range is the more general concept of optical depth. For a target at a distance x , this is defined as $x b_{at}$. It is dimensionless; if b_{at} is held constant it represents distance, and if the distance is constant, it represents changes in b_{at} . From eq 1, the visual range corresponds to an optical depth of 3.9, and a distance of about one quarter of the visual range is equivalent to an optical depth of 1.

Despite lacking a firm psychophysical or experimental basis, the visual range defined by the 2% threshold has stood the test of time. However, while visual range has proven to be a good surrogate for atmospheric visibility for the aviation community, it is of limited value in addressing the concerns of the air quality community. Unlike aviation, where poor visibility is of greatest interest, the air quality community is primarily concerned with relatively small changes in good visibility. Pitchford and Malm² have proposed the deciview as a visibility indicator more suited to air quality regulations. If the extinction coefficient is given in Mm^{-1} , then deciview is defined as

$$v = 10 \ln(b_{ext}/10) \quad (2)$$

Current regional haze visibility regulations state that:

- (1) A 1-deciview change in haziness is a small, but noticeable, change in haziness under most circumstances when viewing scenes in Class I areas.
- (2) Deciview units are uniform in perception over a wide range of visibility conditions; that is, a 1-deciview change is just perceptible regardless of the visibility conditions.¹

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The next section describes a color matching experiment in the Great Smoky Mountains National Park. The results of this experiment are used to estimate a just-noticeable change in haze based on color perception. The validity of the claims for deciviews will be evaluated by comparison to experimental estimates of JNDs.

EXPERIMENTAL DATA

During summer 1995, a group of researchers from universities, government agencies, and private companies conducted the SouthEast Aerosol and Visibility Study (SEAVS) in the Great Smoky Mountains National Park. The SEAVS focused largely on aerosol composition,^{5,6} airborne particle size distribution,^{7,8} and the role of water in the aerosol.^{9,11} However, the SEAVS had a number of other aspects, including a study of the perception of color through atmospheric haze.¹² The methods and primary results of the color perception study are described below.

The perceived colors of natural targets were quantified by color matching using a specially constructed visual colorimeter.¹³ An observer looked at some scene element, such as a barn or green field, with one eye. The observer looked with the other eye in the visual colorimeter at a color spot, which the observer adjusted to match the color of the target. The perceived color was recorded as the amount of red, green, and blue light in the color match. At the same time, the spectrum of the light coming from the target was measured by a telespectroradiometer. A color appearance model was applied to produce measures of the perceived color as recorded by the visual colorimeter and as calculated from the spectrum.¹⁴

Of most interest here are the hue and colorfulness. The hue is what most people call the color—red, green, blue, yellow, and so on. It is quantified as a mixture of pure red, green, blue, or yellow lights. The colorfulness is the degree to which the hue is expressed; it is similar to the concept of saturation. A deep red color would have a colorfulness of about 100, while a colorfulness of 10 or less is almost achromatic (i.e., white or gray).

Two observers (Mahadev and Urquito) made color matches of a set of natural targets during the SEAVS. These observers were both males in their 20s with normal color vision. Each had received extensive training in color matching using the visual colorimeter. The scattering coefficient of the atmosphere was measured by a nearby nephelometer; particle absorption was small and its contribution to the extinction coefficient ignored. The full details of the experiment are found in Mahadev.¹⁵

The perception study found that viewing through a semitransparent atmosphere affected the perception of hue and colorfulness in a highly nonlinear way. The eye appeared to split the light coming from the target into two parts, the haze and the target. The result was that as

the haze increased, the hue of the target as seen by the observer remained constant. However, because the increasing haze scattered more light into the sight path, the hue calculated from the spectrum became bluer. To the observer, the main effect of haze was to decrease the perceived colorfulness. Furthermore, the decrease in colorfulness seemed to be exponential with optical depth (optical depth is the dimensionless product of the extinction coefficient and distance):

$$M(\tau) = M_0 \exp(-\tau) \quad (3)$$

where $M(\tau)$ is the colorfulness of the object at optical depth τ and M_0 is the colorfulness at zero optical depth (i.e., no haze). M_0 is also known as the inherent colorfulness. The colorfulness of the horizon was assumed to be small enough to be taken as zero—the horizon was perceived to be white. This result implies that a JND in colorfulness can be taken to be a JND in haze.

JND in Colorfulness

Estimates of JNDs in colorfulness were based on sets of repeated color matches made during periods when the observing conditions (cloud cover, haze level, and lighting) were judged to be constant or nearly so. Observer Urquito made six sets of repeated matches.¹⁵ Figure 1 is a plot of all the repeated observations of the colorfulness of the red barn roof made by this observer versus optical depth. The exponential fit given by eq 1 is fairly good ($R^2 = 0.68$). The error bars in the figure are twice the standard deviation given in Table 1. They show that one set

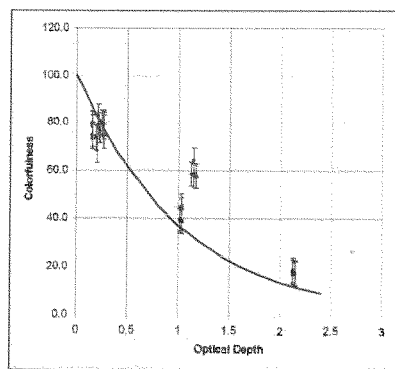


Figure 1. Colorfulness vs. optical depth for observer Urquito for repeated observations of the red barn roof. The line is an exponential fit as in eq 1, and the error bars are two times the standard deviation given in Table 2.

Table 1. Repeated measurements of the red barn roof by observer Mahadev.

Date	Time	Scattering Coefficient (Mm) ⁻¹	Visual Range (km)	Colorfulness		Spectra Hue		Perceived Hue	
				Spectra	Perceived	% Red	% Blue	% Red	% Blue
7/29/95	10:20 a.m.	37	105.7	38.0	42.2	53	47	97	3
7/29/95	10:46 a.m.	39	100.3	38.9	45.6	40	60	92	6
7/29/95	10:54 a.m.	39	100.3	39.9	45.4	38	62	99	1
7/29/95	11:03 a.m.	42	93.1	35.6	46.3	52	48	92	8
7/29/95	11:12 a.m.	42	93.1	37.5	44.9	53	47	93	7
7/25/95	11:49 a.m.	65	60.2	31.2	41.1	50	50	88	12
7/25/95	12:01 p.m.	65	60.2	30.8	45.1	42	58	84	16
7/25/95	12:12 p.m.	65	60.2	30.4	44.1	53	47	91	9
7/25/95	12:19 p.m.	65	60.2	29.4	43.0	54	46	91	9
7/25/95	12:24 p.m.	65	60.2	29.2	48.4	47	53	93	7
8/11/95	9:46 a.m.	157	24.9	37.6	29.2	19	81	97	3
8/11/95	9:57 a.m.	157	24.9	37.2	28.8	22	78	98	2
8/11/95	10:07 a.m.	157	24.9	37.5	29.2	23	77	98	2
8/11/95	10:16 a.m.	161	24.3	36.3	34.9	24	76	98	2
8/11/95	10:21 a.m.	161	24.3	36.7	29.5	23	77	98	2
8/14/95	10:12 a.m.	311	12.6	44.4	18.2	9	91	91	9
8/14/95	10:18 a.m.	312	12.5	44.0	18.4	8	92	97	3
8/14/95	10:30 a.m.	313	12.5	44.8	17.6	7	93	95	5
8/14/95	10:34 a.m.	313	12.5	44.7	18.1	7	93	94	6
8/14/95	10:38 a.m.	313	12.5	44.3	18.3	8	92	94	6
8/18/95	11:00 a.m.	595	6.6	35.3	9.7	2	98	91	19
8/18/95	10:46 a.m.	616	6.4	35.4	6.8	2	98	98	2
8/18/95	10:50 a.m.	616	6.4	35.2	9.4	2	98	91	9
8/18/95	10:53 a.m.	616	6.4	35.0	7.3	2	98	99	1
8/18/95	10:57 a.m.	616	6.4	35.7	10.0	2	98	97	3

of repeated measurements had colorfulness values that deviated much more than 2 sigma from the exponential line. However, the spread of these values about the mean was about the same as other observations for the same optical depth. This shows that the variability in the colorfulness numbers is not affected by systematic observer bias in the average colorfulness, and that the variability will be used to define the JND. The observations of the same target by the other observer are discussed in detail below.

Table 1 gives the results of five sets of repeated matches by observer Mahadev for the roof of a red barn about 3.5 km distant. Table 1 is sorted by the extinction coefficient so that one can easily see that the perceived hue did not change with increasing haze, but that the hue derived from the spectrum changed from red to blue. Colorfulness had the opposite behavior; the perceived values decreased with increasing haze and the values from the spectrum stayed about the same. Two-way

analysis of variance was applied to estimate the random error in the sets of repeated measurements in Table 1. This analysis was repeated for both observers' matches of five additional natural targets. The results are given in Table 2. The standard deviation for both observers was 2.05, as calculated from the average of the variances. Although viewing conditions were chosen to be constant, some of this variability was due to small changes in atmospheric conditions.

Based on these results, one can define the JND in colorfulness in many ways. One appropriate definition for this application is based on the following thought experiment. An observer matches a target with the visual colorimeter and determines the colorfulness to be C_i . The extinction coefficient of the atmosphere is decreased, so the colorfulness of the target is increased by an amount ΔC .

The observer matches the target again to get the new colorfulness C_j . A JND is defined as the value of ΔC that gives a 95% probability that $C_j - C_i > 0$. Assume that C_i and C_j are normal random variables with standard deviation s and means C_0 and $C_0 + \Delta C$, respectively (statistical analysis of the SEAVS color matching data confirms that this is a good assumption). Then $C_j - C_i$ is a normal random variable with mean ΔC and standard deviation $2^{1/2}\sigma$. The value of ΔC needed to ensure a 95% probability that $C_j - C_i > 0$ is given by $2^{1/2}\sigma F(0.95)$, where $F(0.95)$ is the inverse of the cumulative standard normal distribution and is equal to 1.645. Thus, the colorfulness JND is taken to be $2^{1/2}\sigma F(0.95) = 2.326\sigma$. From Table 2, using the data for both observers gives $\sigma = 2.05$, and a 1 colorfulness JND is 4.8. This value of σ includes the effects of small random variations in natural illumination, which should be included for this application because they are inevitably present, but makes the value of a colorfulness JND a bit larger than it would be otherwise.

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Table 2. Standard deviations of colorfulness for repeated matches of natural targets.

Target	Observer		Distance (km)
	M	U	
White silo	0.91	1.33	3.54
Red roof	1.93	2.41	3.54
Near green meadow	2.93	2.15	3.86
Green hills	2.15	3.46	5.15
Far green meadow	1.45	1.64	10.48
Horizon sky	1.53	1.19	
Average	1.92	2.17	
Number of observations	55	60	

Deciviews and Colorfulness JNDs

Relationships between colorfulness, deciviews, and optical depth are derived below; these will be applied to test the validity of the properties of deciviews given in the regional haze regulations.

From eqs 2 and 3, an expression for deciviews v as a function of colorfulness M is derived:

$$v = 10 \ln \left(-\frac{1}{10x} \ln \left(\frac{M}{M_0} \right) \right) \quad (4)$$

For a given optical depth and inherent colorfulness, the equations above were used to calculate the change in deciviews needed to give a 1-JND increase in colorfulness, using 4.8 as a JND. Figure 2 is a plot of the results as a function of optical depth for objects with three levels of inherent colorfulness. These levels of inherent colorfulness represent a reasonable range for natural targets.¹² As might be expected, more colorful objects are more sensitive to changes in atmospheric haze. Perhaps unexpectedly, the figure shows that landscape features at a distance corresponding to an optical depth of 1–2 are the most sensitive to changes in extinction as measured by deciviews. This range corresponds to one quarter to one half of the visual range. Landscape features outside this range are much less sensitive to changes in haze. If the deciview scale were perceptually uniform, as claimed in the regional haze rules, then the lines in the figure would be horizontal, or at least approximately so. However, the change in deciviews needed to produce a 1-JND change in colorfulness varied a great deal with optical depth and inherent colorfulness. The figure also shows that a 1-JND change in colorfulness always requires more than a 1-deciview change, sometimes much more.

DISCUSSION AND CONCLUSIONS

Regional atmospheric haze affects visibility by producing a visible haze layer that limits the visual range, reduces

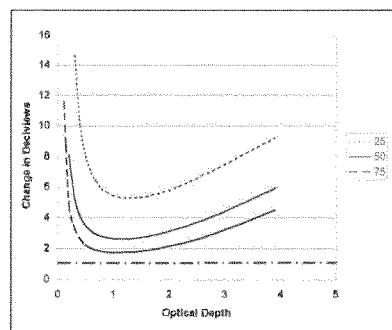


Figure 2. Change in deciviews needed to produce a just-noticeable increase in colorfulness for objects with an inherent colorfulness of 25, 50, and 75. The horizontal dashed dotted line represents what would be expected if a 1-deciview change were actually a uniform measure of haze perception.

contrast, and decreases the colorfulness of objects seen through the haze. Of these three effects of haze, the decrease in colorfulness may be the most important and sensitive visual cue. Visual range is not often useful for judging the effects of small changes in extinction. For example, a change in visual range from 50 to 60 km will not be noticed if the most distant landscape feature is at 25 km. The effect of haze on contrast is a better candidate as an indicator of change in haze; however, perceived contrast, like perceived hue, is affected in a nonlinear fashion by the semitransparent nature of haze and is not a sensitive indicator of changes in atmospheric haze.¹⁶ Experimental data have shown that colorfulness is a sensitive measure of changes in haze, so this article has used it to define just-noticeable changes in atmospheric haze.

A just-noticeable decrease in atmospheric haze is defined as a decrease in extinction that would produce a 95% probability of a measurable increase in colorfulness of an object seen through the haze. From the experimental evidence from the two young male observers, a JND in colorfulness was 4.8. For the population in general, this number is certainly too low, since all visual functions decline with age. Thus, the conclusions below about the deciview scale based on this number are understated for the general population.

Analysis of the experimental data showed that for a JND in atmospheric haze as defined above:

- (1) The deciview scale is not uniform in perception over a wide range of visibility conditions. In fact, the change in deciviews needed to be noticeable

varies greatly depending on the optical distance of the landscape feature and its inherent colorfulness.

(2) A 1-deciview change is never noticeable.

What are the implications of these results for measuring progress toward reducing regional haze using the deciview metric? This is difficult to judge because the current proposals are very complex, using particulate measurements and relative humidity to estimate the extinction coefficient and average deciviews for the 20% most-impaired and 20% least-impaired days. The goal is to show no change on the least-impaired days and improvement on the most-impaired days, leading to natural conditions by 2064.¹⁷

The results of this article highlight a possible flaw in this regulatory scheme based on the deciview metric. An unstated assumption is that the nature of the scenic vista can be ignored—that is, a given deciview change will affect the perception of all landscape features in all scenes in the same way. Figure 2 shows that this is approximately true only if all the important landscape features have nearly the same inherent colorfulness and are at distances that correspond to an optical depth of between 1 and 2, or about one quarter to one half of the visual range. In this limited case, the deciview is indeed a uniform metric. However, most scenic vistas do not fit these restrictions and, by Figure 2, will require greater decreases in extinction as measured by deciviews to show a perceptible change. The result is that the emission reductions required by the proposed regulatory analysis are likely to produce much smaller improvements in perceived effects of regional haze than expected. The EPA guidance documents provide an example of an eastern scenic vista with a baseline of 27 deciviews and natural conditions of 11.¹⁷ The decrease in extinction to reach natural conditions by 2064 is 0.35 deciview/yr, or 1.75 deciviews in five years. This five-year reduction should, according to the regulations, result in a noticeable change in regional haze. However, the results herein predict that there would very likely be no noticeable difference in any actual scenic vista in the region as a result of the required emission reductions.

Regional haze rules also call for a uniform rate of improvement in visibility (measured in deciviews) that is needed to go from current conditions to natural conditions by 2064. Since the deciview scale is not uniform in perception over a wide range of visibility conditions, this requirement is also flawed and will not result in uniform improvement in perceived visibility.

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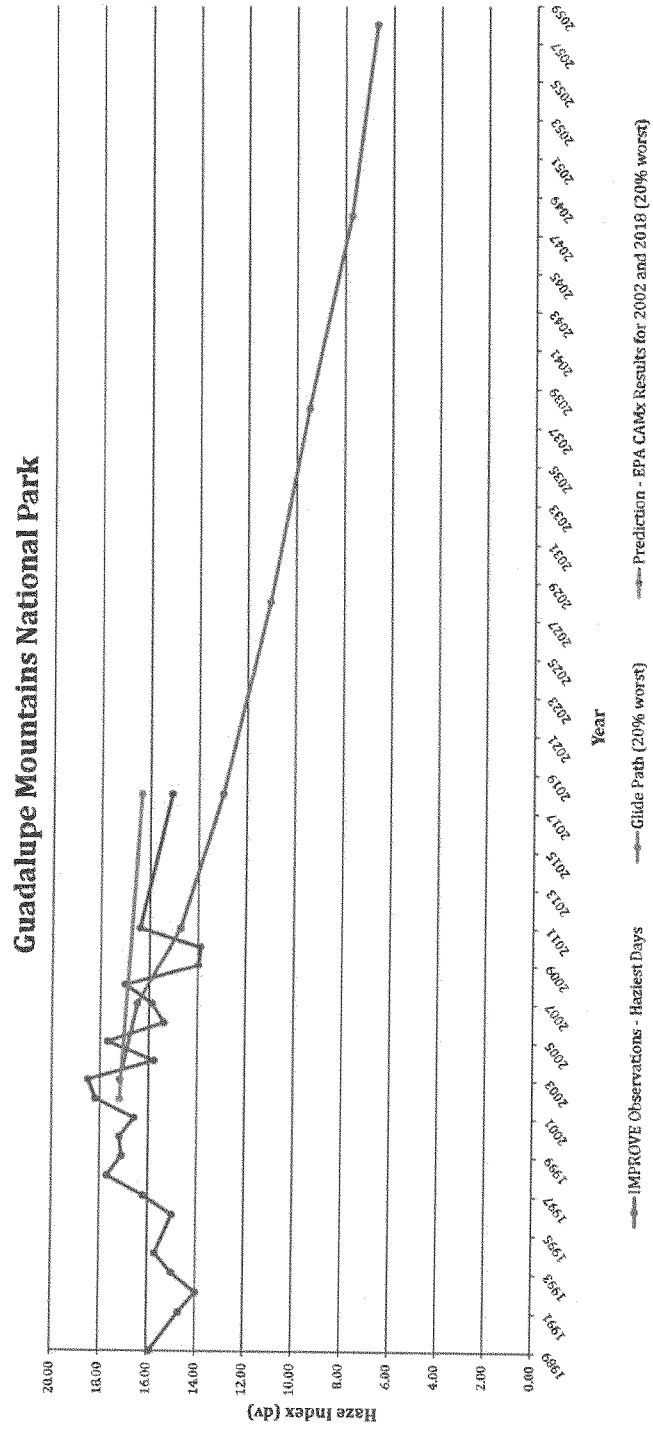
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APPENDIX B



APPENDIX C



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Atmospheric Environment

Journal homepage: www.elsevier.com/locate/atmosenv

Review

Compilation and interpretation of photochemical model performance statistics published between 2006 and 2012

Heather Simon^a, Kirk R. Baker, Sharon Phillips^a U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, 109 TW Alexander Dr., Research Triangle Park, NC 27711, USA

HIGHLIGHTS

- Compilation of operational air-quality model evaluations published from 2006 to 2012.
- Model performance summarized for ozone and PM_{2.5}.
- Model performance also shown for wet deposition of sulfate, nitrate, ammonium, and Hg.
- Benefits of common performance metrics are discussed and evaluated.
- Recommendations given on how to perform evaluations for regulatory applications.

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ABSTRACT

Regulatory and scientific applications of photochemical models are typically evaluated by comparing model estimates to measured values. It is important to compare quantitative model performance metrics to a benchmark or other studies to provide confidence in the modeling results. Since strict model performance guidelines may not be appropriate for many applications, model evaluations presented in recent literature have been compiled to provide a general assessment of model performance over a broad range of modeling systems, modeling periods, intended use, and spatial scales. Operational model performance is compiled for ozone, total PM_{2.5}, speciated PM_{2.5}, and wet deposition of sulfate, nitrate, ammonium, and mercury. The common features of the model performance compiled from literature are photochemical models that have been applied over the United States or Canada and use modeling platforms intended to generally support research, regulatory or forecasting applications. A total of 59 peer-reviewed articles which include operational model evaluations and were published between 2006 and March 2012 are compiled to summarize typical model performance. The range of reported performance is presented in graphical and tabular form to provide context for operational performance evaluation of future photochemical model applications. In addition, recommendations are provided regarding which performance metrics are most useful for comparing model applications and the best approaches to match model estimates and observations in time and space for the purposes of metric aggregations.

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1. Introduction

Eulerian photochemical models implement numeric algorithms to predict air pollutant concentrations and deposition on local to continental scales. These models calculate the effects of emissions, transport, chemistry, particle physics, and deposition to estimate concentrations of air pollutants in space and time. Photochemical models are applied for a range of purposes such as evaluation of air

pollution control scenarios by state and local governments, development of national air pollution rules, forecasting of air quality for public health and safety, investigations of scientific questions about atmospheric chemistry and physics, and research on the health effects of air pollution. All of these applications require credible science and acceptable model performance.

Regulating agencies must demonstrate that the modeling platform used to support potential control implementation compares well with observations. However, there is no strict guideline for model performance given the large variability in model applications and intended uses (United States Environmental Protection Agency, 2007). Operational performance evaluation is the most common

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approach to compare model estimates to the corresponding measured pollutant concentrations. Diagnostic evaluations investigate specific model processes frequently using specialized measurements and modeling tools such as process analysis and the direct decoupled method which isolate and track the effects of individual chemical and physical processes. Dynamic evaluations look at model response to perturbations of the inputs such as the predicted relative change in ozone resulting from the reduction of nitrogen oxide (NO_x) emissions (Napelenok et al., 2011). Diagnostic and dynamic evaluations provide useful insight into model formulation and parameterization, whereas operational performance evaluations against measurements taken at routine monitor networks provide more broadly contextual information for comparison with new modeling applications (Hogrefe et al., 2008).

Modeling studies for regulatory purposes need to provide context about how well that modeling application compares to measured values in relation to other independent studies. This builds confidence that the modeling study appropriately captures processes which lead to high pollution episodes and thus is a reliable tool to support pollution control strategy development. Currently, there is no article in the peer-reviewed literature that summarizes model performance for ozone, speciated $\text{PM}_{2.5}$, and wet deposition from recently published studies that could provide a useful benchmark against which regulatory modelers can gauge their model performance. Model performance reviews for specific pollutants have been published in the past. An ozone model performance review paper (Tesche, 1988) similarly compiles ozone photochemical model performance from studies up through the 1980s. While the performance metrics reported in previous decades may fall within ranges presented in this review paper, the recommendation from that era are not relevant today given the increasing complexity in photochemical model chemistry and physics, domain size and resolution, configuration options, and length of application.

This work presents a compilation of operational model evaluations for ozone, $\text{PM}_{2.5}$, and wet deposition of sulfate, nitrate, ammonium, and mercury based on model evaluations published in peer reviewed journals between 2006 and March 2012. While operational model performance metrics are simple to estimate, the literature review revealed a general tendency by researchers to provide little detail regarding fundamental assumptions made for aggregate metric calculations. In addition, this review uncovered a general lack of consistency in evaluation methodologies hindering our ability to compile a complete summary of comparable evaluation results. Consequently this study also presents recommendations for operational model performance evaluation and reporting so that future studies can provide a clearer picture of the state-of-the-science in air-quality model performance.

2. Methods

A total of 69 peer-reviewed articles published between 2006 and March 2012 have been compiled. These studies report quantifiable metrics from operational evaluations of regional photochemical models applied over some portion of the United States or Canada. Data from studies that reported results in graphical form only were not included in this review unless metrics could be quantitatively determined from these graphs. Statistical metrics are compiled on model performance for both ambient pollutant concentrations and wet deposition mass. Table 1 summarizes the general characteristics of the studies identified in this synthesis. Many studies reported multiple values for various performance metrics of a specific pollutant. When these values came from separate model simulations or were separated by season or region

of the country, they were included as separate data points in our review. When separate performance metrics were reported for the same model simulation but for different monitoring networks, for different sites within a small region, or for different days within a season, the best reported model performance is used in this analysis.

The studies compiled for this project present a variety of model performance metrics: mean bias/error (MB/ME), root mean square error (RMSE), mean normalized bias/error (MNB/MNE), normalized mean bias/error (NMB/NME), fractional bias/error (FB/FE), unpaired peak accuracy (UPA), index of agreement (IofA), and the coefficient of determination (r^2). Table 2 shows the formulas for calculating each statistical metric summarized in this paper. Metrics given in the same units as the measurements (absolute metrics) are MB, ME, and RMSE. MB quantifies the tendency of the model to over- or under-estimate values while ME and RMSE measure the magnitude of the difference between modeled and observe values regardless of whether the modeled values are higher or lower than observations. For these metrics to be meaningful, the evaluator must be familiar with typical observed magnitudes in order to understand whether bias and error are “large”.

One disadvantage of absolute metrics is that they make inter-comparisons of model performance in clean and polluted environments or across different pollutants difficult to interpret. Consequently, a range of relative metrics are often used. These metrics are presented either in fractional or percentage units. In this analysis all normalized values are given as percentages. MNB, MNE, NMB, and NME all normalize by observed values. For MNB, the normalization is paired in space and time with the reported bias/error while NMB first finds the mean absolute bias/error and then normalizes this value based on the mean observed value. MNB and MNE have the tendency to be weighted towards larger percentages because bias/error at very small observed values is often very large in percentage units (Boylan and Russell, 2006). This behavior means that these metrics often do a poor job of describing model performance in polluted conditions because they are so heavily weighted by modeled to measured differences at low observed values. In addition, this sometimes leads to a positive MNB when the absolute MB is negative. NMB and NME do not suffer from these problems. FB and FE normalize bias and error by the average of the observed and modeled concentration. Some researchers prefer the FB bias metric because it is symmetrical around 0 (Boylan and Russell, 2006). The range of possible FB values are from -200% to 200% , while the range of MNB and NMB values is from -100% to $+\infty$. Therefore, anyone interpreting the MNB or NMB metrics must understand that the magnitude of positive values in fractional units is equivalent to one minus the inverse of the magnitude of negative values in fractional units. For instance a factor of ten over-prediction leads to a $\text{NMB} = 1000\%$ (10 in fractional units) while a factor of ten under-prediction leads to a $\text{NMB} = -90\%$ (-0.9 in fractional units). Two studies (Appel et al., 2008; Foley et al., 2010) report median instead of mean values for bias, error, and normalized bias and error. Since only two studies used median values, reported MdnB , MdnE , NMdnB , and NMdnE values are grouped with MB, ME, NMB, and NME values.

Metrics such as IofA, r , and r^2 provide a sense of the strength of relationship between model estimates and observations that have been paired in time and space. The coefficient of determination (r^2) is 1 when modeled estimates and observations have a perfect linear relationship and 0 where no linear relationship exists. The coefficient of determination can be physically interpreted as indicating the portion of variability in the model prediction which can be accounted for by variability in the observed values. The correlation coefficient (r) does not have the same strict operational interpretation as the coefficient of determination but is often used because

Table 1
Summary of operational evaluation studies included in this review.

Reference	Models evaluated	Pollutants evaluated	Seasons evaluated	Regions evaluated
(Appel et al., 2007)	CMAQ	Ozone (8-h max)	Summer	Eastern US
(Appel et al., 2008)	CMAQ	PM _{2.5} , ammonium, nitric acid, nitrate, TNO ₃ , sulfate, OC, EC, TC	Annual, summer	Eastern US
(Appel et al., 2010)	CMAQ	Ozone, ozone (8-h max), PM _{2.5} , ammonium wetdep, nitrate, TNO ₃ , nitrate wetdep, sulfate, sulfate wetdep, TC	Summer, winter	Eastern US
(Appel et al., 2011)	CMAQ	Ammonium wetdep, nitrate wetdep, sulfate wetdep	Annual, fall, spring, summer, winter	Eastern US, North America
(Arnold and Dennis, 2006)	CMAQ	Ozone (1-h max)	Summer	Southeast US
(Baker and Scheff, 2007)	CAMx	Ammonia, ammonium, nitric acid, nitrate, TNO ₃ , SO ₂ , sulfate, TSO ₄	Annual	Midwest
(Baker and Scheff, 2008)	CAMx	Ammonia wetdep, nitrate wetdep, sulfate wetdep	Fall, spring, summer, winter	Midwest
(Baker and Bash, 2012)	CAMx, CMAQ	Total Hg wetdep	Annual, fall, spring, summer, winter	Eastern US, Western US
(Bullock et al., 2009)	CMAQ, REMSAD, TEAM	Total Hg wetdep	Annual	Continental US
(Byun et al., 2007)	CAMx, CMAQ	Ozone	Summer	Houston area
(Carlton and Baker, 2011)	CMAQ	Formaldehyde, isoprene	Summer	Midwest
(Chen et al., 2008)	CMAQ	Ozone (8-h max), PM _{2.5} , ammonium, nitrate, sulfate, OC, EC	Summer/fall, summer	Pacific Northwest
(Cho et al., 2009)	AURAMS	Sulfate	Fall	Edmonton Canada
(Eder and Yu, 2008)	CMAQ	Ozone (1-h max), ozone (8-h max), PM _{2.5} , ammonium, nitrate, sulfate, OC, EC	Annual	North America
(Eder et al., 2006)	CMAQ	Ozone (8-h max)	Summer	California, Lower Midwest, Northeastern US, Pacific Northwest, Rocky Mountains, southeast US, Upper Midwest
(Eder et al., 2009)	CMAQ	Ozone (8-h max)	Summer	North America
(Foley et al., 2010)	CMAQ	Ozone (8-h max), PM _{2.5} , ammonium, ammonium wetdep, nitrate, TNO ₃ , nitrate wetdep, sulfate, sulfate wetdep, OC, EC, TC, PM ₁₀	Winter, summer	Eastern US
(Gaydos et al., 2007)	PMCAMx	Ozone, NO, NO ₂ , PM _{2.5} , ammonium, TNH ₄ , nitrate, SO ₂ , sulfate, TNO ₃ , OC, EC, TC	Summer	Eastern US, Pittsburgh
(Gego et al., 2006)	CMAQ, REMSAD	Nitrate, sulfate	Fall, spring, summer, winter	Central US, Great Lakes, Northeastern US, Southeast US, Western US
(Gong et al., 2006)	AURAMS	Ammonium, HNO ₃ , nitrate, TNO ₃ , SO ₂ , sulfate, total S	Summer	Eastern US
(Gorline and Lee, 2009)	CMAQ	PM _{2.5}	Summer	Great Lakes, Northeastern US, Rocky Mountains
(Grell et al., 2005)	MMS/Chem, WRF/Chem	Ozone, ozone (avg 11am–7pm), NO _x , SO ₂	Summer	Northeastern US
(Hogrefe et al., 2007)	CMAQ	Ozone (8-h max), PM _{2.5}	Summer, winter	New York
(Hogrefe et al., 2008)	CAMx, CMAQ	Ozone (8-h max)	Summer	Northeastern US
(Hogrefe et al., 2011)	CMAQ	Ozone (8-h max)	Summer	Northeastern US
(Jin et al., 2010)	CMAQ	Ozone, ozone (1-h max), ozone (8-h max), CO, NMHC, NO _x	Summer	California
(Kang et al., 2010)	CMAQ	Ozone (8-h max), PM _{2.5}	Summer, winter	Lower Midwest, Northeastern US, Pacific coast, Rocky Mountains, Southeast US, Upper Midwest
(Karamchandani et al., 2006)	CMAQ-MADRID, CMAQ-MADRID-APT	PM _{2.5} , ammonium, HNO ₃ , nitrate, SO ₂ , sulfate, OC, EC	Summer, winter	Southeast US
(Kim et al., 2009)	WRF/Chem	NO _x – column	Summer	North America
(Kim et al., 2010)	CMAQ	Ozone (8-h max)	Summer	Southeast US
(Lee et al., 2011)	CMAQ	PM _{2.5}	Summer	Central US, Eastern US, North America, Western US
(Liu et al., 2007)	CMAQ	Total Hg wetdep	Summer, winter	North America
(Liu et al., 2012)	CMAQ	Ozone (1-h max), ozone (8-h max), PM _{2.5} , ammonium, ammonium wetdep, nitrate, nitrate wetdep, sulfate, sulfate wetdep, OM, EC	Annual	North America
(Liu et al., 2010)	CMAQ	Ozone (1-h max), ozone (8-h max), PM _{2.5} , ammonium, ammonium wetdep, nitrate, nitrate wetdep, sulfate, sulfate wetdep, OM, EC	Summer, winter	North Carolina
(Makar et al., 2010)	AURAMS	Ozone, ozone (1-h max), PM _{2.5} , PM _{2.5} (1-h max)	Summer	Canada, North America, Ontario

Table 1 (continued)

Reference	Models evaluated	Pollutants evaluated	Seasons evaluated	Regions evaluated
(Marmur et al., 2009)	CMAQ	Ozone, CO, NO, NO ₂ , PM _{2.5} , ammonium, HNO ₃ , nitrate, SO ₂ , sulfate, SOIL, OC, EC	Annual	Southeast US
(Misenis and Zhang, 2010)	WRF/Chem	Ozone, CO, NO, NO ₂ , PM _{2.5}	Summer	Houston area
(Molders et al., 2010)	WRF/Chem	PM ₁₀ , PM _{2.5}	Summer	Alaska
(Morris et al., 2006)	CAMX, CMAQ	OC, TC	Summer	Southeast US, Central US, Midwest, Northeastern US, Western US
(Napelienok et al., 2011)	CMAQ	Ozone (8-h max)	Summer	Eastern US
(Otte, 2008)	CMAQ	Ozone (1-h max)	Summer	Eastern US
(Park et al., 2010)	AURAMS	PM _{2.5} , SOIL	Fall, spring, summer, winter	Eastern US, Western US
(Pun et al., 2008)	CMAQ-MADRID	Ozone, PM _{2.5} , ammonium, nitrate, SO ₂ , sulfate, OM, EC	Summer	Texas and neighboring states
(Queen and Zhang, 2008a, b)	CMAQ	Ammonium, ammonium wetdep, nitrate, nitrate wetdep, sulfate, sulfate wetdep	Summer, winter	North Carolina
(Rodríguez et al., 2009)	CAMx	Ozone	Annual	Western US
(Rodríguez et al., 2011)	CAMx	Ozone, NO _x , ammonia, ammonium, nitrate, SO ₂ , sulfate	Annual	Western US
(Roy et al., 2007)	CMAQ	Ammonium, nitrate, sulfate, OC, EC, TC	Spring, summer	Rocky Mountains, North America, Western US
(Sakulyanonvitayaya et al., 2008)	CMAQ	OM	Summer	North America
(Seligman et al., 2006)	TEAM	Total Hg wet deposition	Annual	North America
(Smyth et al., 2006)	CMAQ	Ozone, ozone (1-h max), PM _{2.5} , ammonium, nitrate, sulfate, OM	Summer, winter	North America
(Smyth et al., 2009)	AURAMS, CMAQ	Ozone, ozone (1-h max), ozone (1-h min), PM _{2.5} , ammonium, nitrate, sulfate, OM, EC	Summer	Pacific Northwest
(Spak and Holloway, 2009)	CMAQ	PM ₁₀ , PM _{2.5} , ammonium, nitrate, sulfate, OM, EC	Summer	North America
(Stroud et al., 2011)	AURAMS	OM	Fall, spring, summer, winter	Upper Midwest
(Tang et al., 2011)	CMAQ	Ozone (8-h max), NO _x	Summer	Eastern US
(Tarasick et al., 2007)	AURAMS, CHORNOB	Ozone	Summer	Houston area
(Teschke et al., 2006)	CMAQ	Ammonium, nitrate, sulfate, OC, EC	Summer	Eastern US, North America
(Tong and Mauzerall, 2006)	CMAQ	Ozone	Annual	Southeast US
(Vijayaraghavan et al., 2007)	CMAQ-MADRID	Total Hg wet deposition	Summer	North America
(Vijayaraghavan et al., 2008)	CMAQ-AMSTERDAM	Total Hg wet deposition	Summer	North America
(Wu et al., 2008)	CMAQ	Ozone (1-h max), ozone (8-h max), PM _{2.5} , ammonium, nitrate, sulfate, OC, EC	Annual	Continental US
(Ying et al., 2008)	UCD/CIT	PM _{2.5} , ammonium, nitrate, sulfate, OC, EC	Winter	California
(Yu et al., 2006)	CMAQ	Ozone, CO, NO, NO ₂ , PM _{2.5} , ammonium, nitrate, sulfate, OC, EC	Summer	Northeastern US
(Yu et al., 2007)	CMAQ	Ozone, ozone (1-h max), ozone (8-h max), CO, NO, NO ₂ , NO _x , PAN, SO ₂	Summer	Northeastern US, Eastern US
(Yu et al., 2008)	CMAQ	Ozone, ozone (1-h max), ozone (8-h max), CO, NO, NO ₂ , SO ₂	Summer	Eastern US
(Zhang et al., 2006)	CMAQ	PM _{2.5} , PM _{2.5} (hourly), ammonium, nitrate, SO ₂ , sulfate, OC, EC, TC	Summer	North America, Southeast US
(Zhang et al., 2007)	CMAQ	Ozone, ozone (1-h max), ozone (8-h max), ammonium, nitrate, sulfate, OC, EC	Fall, spring, summer, winter	Eastern US, Southeast US, Western US, North America
(Zhang et al., 2009)	CMAQ	Ozone (1-h max), ozone (8-h max), PM _{2.5} , ammonium, ammonium wetdep, nitrate, nitrate wetdep, sulfate, sulfate wetdep, OC, EC	Annual, fall, spring, summer, winter	North America
(Zhang et al., 2010)	WRF/Chem-MADRID	Ozone, PM _{2.5}	Summer	Texas

it provides an indication of the strength of linear relationship and is signed positive or negative based on the slope of the linear regression. For the purpose of this synthesis, all r values were converted to r^2 to increase comparability between studies. The UPA metric is intended to measure a model's ability to capture peak pollutant concentrations, but does not pair the model estimates with observations in time or space.

Performance is best when bias and error metrics approach zero and when the coefficient of determination approaches 1. However, as shown in Section 3.1, perfect agreement for any metric alone may not be indicative of good model performance. Multiple metrics

must be considered when evaluating model performance. In addition, perfect performance is not possible given that observations themselves are subject to uncertainties related to measurement technique and analytical approach. Models cannot be expected to achieve accuracy beyond the measurement uncertainty of the instruments. It is important to know which, if any, corrections have been made for measurement artifacts. For example, PM_{2.5} is measured gravimetrically from Teflon filters which likely have measurement artifacts from nitrate volatilization, organic carbon (OC) positive artifact, OC negative artifact, and water absorption (Frank, 2006; Simon et al., 2011). In addition, some NO_x

Table 2

Definitions of performance metrics.

Abbreviation	Term	Definition ^a
MB	Mean bias	$\frac{1}{N} \sum (M_i - O_i)$
ME	Mean error	$\frac{1}{N} \sum (M_i - O_i)$
RMSE	Root mean squared error	$\sqrt{\frac{\sum (M_i - O_i)^2}{N}}$
FB	Fractional bias	$100\% \times \frac{2}{N} \sum \frac{(M_i - O_i)}{(M_i + O_i)}$
FE	Fractional error	$100\% \times \frac{2}{N} \sum \frac{ M_i - O_i }{(M_i + O_i)}$
NMB	Normalized mean bias	$100\% \times \frac{\sum (M_i - O_i)}{\sum O_i}$
NME	Normalized mean error	$100\% \times \frac{\sum (M_i - O_i)}{\sum O_i}$
MNB	Mean normalized bias	$100\% \times \frac{1}{N} \sum \frac{(M_i - O_i)}{O_i}$
MNE	Mean normalized error	$100\% \times \frac{1}{N} \sum \frac{ M_i - O_i }{O_i}$
UPA	Unpaired peak accuracy	$100\% \times \frac{(M_{peak} - O_{peak})}{O_{peak}}$
I of A	Index of agreement	$1 - \frac{\sum (M_i - O_i)^2}{\sum [(M_i - \bar{O}) + (O_i - \bar{O})]^2}$
r ²	Coefficient of determination	$\frac{(\sum (M_i - \bar{M}) \times (O_i - \bar{O}))^2}{\sum (M_i - \bar{M})^2 \sum (O_i - \bar{O})^2}$

monitors show interference from NO_x species such as PAN and nitric acid (Dunlea et al., 2007). If no artifact corrections have been made then measured and modeled values may represent different pollutant species. Finally, photochemical grid model estimates are grid cell averages and may not always be commensurate with observations that represent a finite space around a point measurement.

3. Results

The 69 articles identified for this analysis used a variety of metrics to characterize model performance for estimating ambient concentrations and wet deposition of many different chemical pollutants. Fig. 1 shows the frequency of use for each statistical metric. The most commonly reported metrics are mean bias, normalized mean bias, normalized mean error, and r^2 . Both ME and RMSE are frequently used as non-normalized error metrics.

Figs. 2 and 3 show the frequency of evaluation of different pollutants broken down by model and by metric. Evaluations of eight different regional photochemical models are included in this literature review: A Unified Regional Air-quality Modeling Systems (AURAMS) (Zhang et al., 2002), the Comprehensive Air Quality Model with extensions (CAMx) (ENVIRON, 2010), the Canadian Hemispheric and Regional Ozone and NO_x System (CHRONOS) (Pudykiewicz and Kozlowski, 2001), the Community Multiscale Air Quality (CMAQ) model (Foley et al., 2010), the fifth generation PSU/NCAR Mesoscale Model coupled with Chemistry (MM5/Chem) (Grell et al., 2000), the Regional Modeling System for Aerosols and Deposition (REMSAD) (SAL, 2002), the UC Davis/California Institute of Technology (UCD/CIT) model (Kleeman and Cass, 2001), and the Weather Research and Forecasting model coupled with Chemistry (WRF/Chem) (Grell et al., 2005). The CHRONOS and AURAMS models are developed by Environment Canada, CAMx and REMSAD are developed by private companies (Environ and ICF consulting), CMAQ is developed at the US EPA, UCD/CIT is developed at CalTech and UC-Davis, and MMS/Chem and WRF/Chem are developed by a team of international researchers from universities and Federal

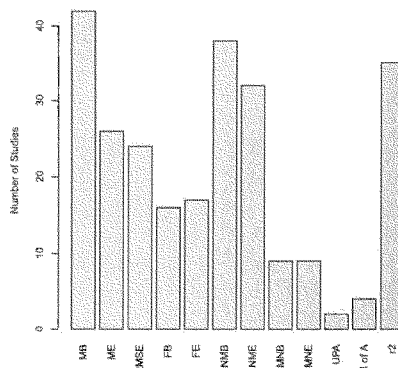


Fig. 1. Number of studies using various metrics in operation evaluation studies compiled in this review.

agencies. Additional models included for mercury evaluation include TEAM (Trace Element Analysis Model) and CMAQ derivative models CMAQ-MADRID (Model of Aerosol Dynamics, Reaction, Ionization, and Dissolution) and CMAQ-AMSTERDAM (Advanced Modeling System for Transport, Emissions, Reactions, and Deposition of Atmospheric Matter). Fig. 2 shows that CMAQ was the most commonly evaluated model in the literature between 2006 and March 2012.

Making intercomparison of model evaluation studies is challenging because studies evaluate pollutants using different time averages, different pollutant classifications, and different metrics.

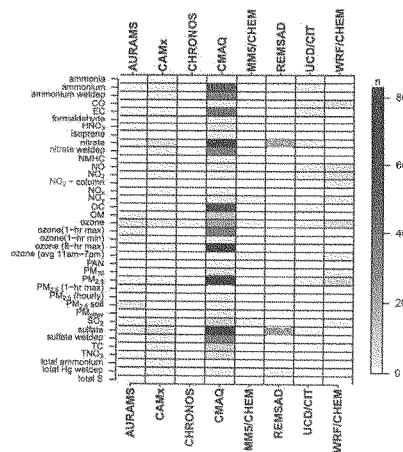
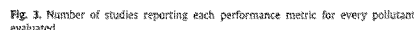


Fig. 2. Number of studies evaluating each paired pollutant and photochemical model.



3.1. Ozone

Fig. 4 shows a summary of ozone performance reported in the identified literature. Performance for one metric cannot be directly compared to any other metric because each metric includes a unique subset of studies. The apparent tendency of ozone overestimation is largely due to the approach taken by investigators of averaging performance metrics over high and low ozone hours and

To demonstrate the impact of differentiating metric estimates based on levels of ambient concentration, we re-evaluated modeled ozone outputs from Appel et al. (2011). Paired 8-h daily maximum ozone observations and model predictions were aggregated over high and low pollution episodes using no ambient concentration cutoff, a 60 ppb cutoff, and a 75 ppb cutoff. Separate statistics were calculated for the ozone season (May–September) of each year between 2002 and 2006 and for four regions of the U.S.: Northeast, Midwest, Southeast, and Central. The ranges of the statistical metrics for 8-h daily maximum ozone among these years and regions are shown in Table 3 (Table S1 shows this same set of information for hourly ozone). The statistics confirm that 8-h maximum ozone is overestimated when all data is included, but similar to Foley et al. (2010), modeled 8-h max ozone is underestimated when statistics are only calculated for ambient values above cutoffs of 60 and 75 ppb. In addition to the difference in the direction of ozone bias for high and low ambient ozone levels, it is clear that overall performance varies with ozone concentration. For instance, the r^2 values are substantially lower for high ozone days (between 0.05 and 0.28 for ambient 8-h max ozone above 75 ppb) than for all days (between 0.56 and 0.73). The fractional error and normalized mean error are lowest when a cutoff of 60 ppb is applied indicating that the model performs best for mid-range ambient ozone values. This analysis showed that the modeling performed by Appel et al. (2011) demonstrates an ability to predict ozone concentrations and variability for mid-range values but is less skilled at capturing these characteristics on either very high or very low ozone days. Consequently, in addition to providing aggregate statistics about model performance across all conditions, any model evaluation of ozone for regulatory purposes should also focus on 8-h max ozone estimates for days when ambient concentrations are high. Current EPA modeling guidance (United States Environmental Protection Agency, 2007) recommends calculating performance statistics both without a threshold and with a 60 ppb threshold. The analysis presented here supports the use of a 60 ppb threshold for showing performance at high observed ozone concentrations where modeling is intended for regulatory purposes.

Fig. 5 shows reported ozone performance by grid resolution and indicates that mean bias, as reported in the literature, does not

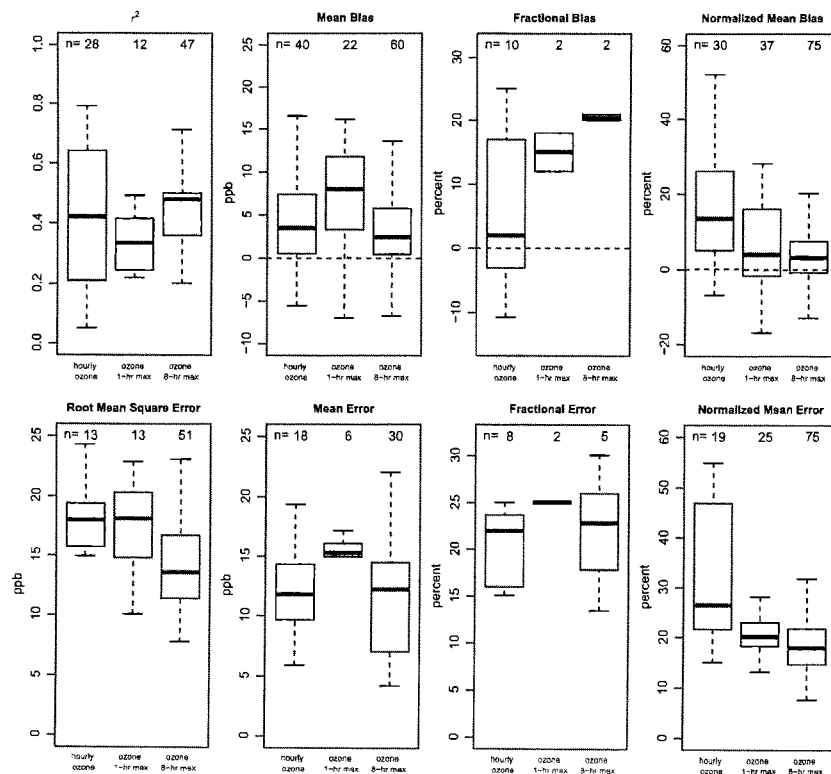


Fig. 4. Summary of ozone performance metrics reported in the evaluated modeling studies. Centerlines show median values, boxes outline the 25th and 75th percentile values and whiskers extend to 1.5 times the interquartile range.

systematically improve at higher grid resolutions. Modeling studies which used finer grid resolution (4 km or less) were more likely to report under-estimation of ozone than modeling studies using coarser grid resolution. This trend is likely due to the ways in which models are applied at coarse and fine resolution rather than the resolution itself. For example, model simulations conducted with a resolution at or finer than 4 km typically simulated episodes that ranged in length from 8 to 30 days. The typical episode length increased to 29–120 days for simulations at resolutions coarser than 4 km. In addition, the finer scale studies were much more likely to focus on small areas; 76% were conducted at a local scale (urban to state level) and 24% were conducted at a regional scale (covering several states). Conversely, only 19% of the coarser scale simulations were conducted on a local scale, while 35% were conducted on a regional scale, and 46% were conducted on

a superregional scale (consisting of multiple regions and covering at least half of the United States). The local scale model simulations are often performed to capture high pollution episodes, when models tend to be biased low. Conversely, longer simulations covering larger regions tend to include locations and time periods of low and mid-range ozone concentrations. Therefore, the under-estimation of ozone in modeling using fine grid resolutions is likely due to the shorter duration episodes with higher ozone concentrations that are the focus of these studies.

Many studies reported multiple performance metrics, which gives a more complete picture of model evaluation. Scatter plots of r^2 values paired with bias (MB, NMB, and FB) are shown in Fig. 6 for 8-h daily maximum ozone and in Fig. 7 for hourly ozone. Each point represents results from a single modeling run. The comparison using 8-h daily maximum ozone in Fig. 6 shows that many low daily

Table 3
Performance metric distributions for 8-hr daily maximum ozone based on data from Appel et al. (2011).

Ozone 8 h daily maximum			Quantile estimate					
Cut-off	Metric	Units	n	10%	25%	50%	75%	90%
None	r^2		20	0.56	0.59	0.62	0.64	0.73
None	MB	ppb	20	1.2	1.8	2.9	3.8	4.4
None	FB	%	20	5.5	5.7	8.4	10.4	11.4
None	NMB	%	20	2.4	3.9	6.1	7.8	9.6
None	RMSE	ppb	20	9.4	9.7	10.0	10.6	10.9
None	ME	ppb	20	7.3	7.5	7.8	8.1	8.5
None	FE	%	20	15.7	17.2	18.1	18.7	19.4
None	NME	%	20	14.9	16.0	17.0	17.2	18.0
60 ppb	r^2		20	0.17	0.21	0.29	0.36	0.41
60 ppb	MB	ppb	20	-8.61	-7.47	-4.95	-4.47	-4.03
60 ppb	FB	%	20	-13.90	-10.88	-7.50	-7.12	-6.67
60 ppb	NMB	%	20	-12.51	-10.07	-6.94	-6.38	-6.00
60 ppb	RMSE	ppb	20	9.49	9.61	10.30	12.83	13.14
60 ppb	ME	ppb	20	7.51	7.60	8.10	9.78	10.41
60 ppb	FE	%	20	11.17	11.58	12.15	14.38	15.80
60 ppb	NME	%	20	10.88	11.15	11.55	13.58	14.58
75 ppb	r^2		20	0.05	0.08	0.19	0.23	0.28
75 ppb	MB	ppb	20	-14.5	-12.1	-9.0	-8.3	-7.8
75 ppb	FB	%	20	-20.0	-15.8	-12.3	-11.5	-10.4
75 ppb	NMB	%	20	-17.5	-14.0	-11.1	-10.3	-9.2
75 ppb	RMSE	ppb	20	12.8	13.3	13.7	16.6	19.5
75 ppb	ME	ppb	20	10.5	10.9	11.4	13.8	15.3
75 ppb	FE	%	20	13.9	14.1	15.0	17.7	21.0
75 ppb	NME	%	20	12.8	13.0	13.9	16.6	18.5

8-h maximum biases are paired with high r^2 values in the studies evaluated. Two outliers shown in Fig. 6 with r^2 less than 0.1 come from the Hogrefe et al. (2011) study and represent performance of 8-h max ozone on low ozone days. Even without these two outlier points, a trend of decreasing bias with increasing r^2 is discernible although there are some low bias points with r^2 values between 0.2 and 0.4. The opposite relationship is shown in Fig. 7, where model simulations with the lowest mean hourly ozone bias also had very low r^2 values. This suggests that the low bias in hourly ozone in these studies is a result of averaging over- and under-estimates which does not provide a useful characterization of the ozone over space and time. This illustrates the importance of evaluating temporal subsets of ozone concentrations that are likely to result from similar formation environments and the value

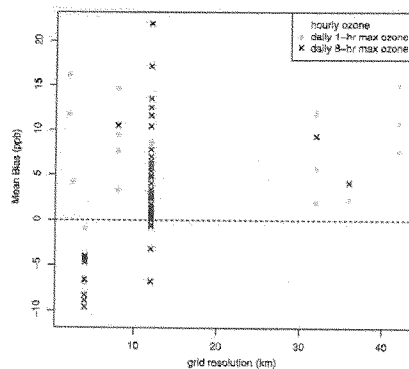


Fig. 5. Reported ozone mean bias as a function of grid resolution.

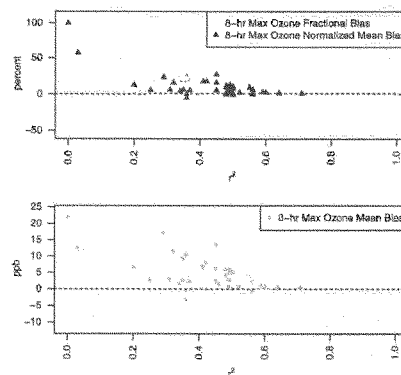


Fig. 6. Comparison of paired bias and r^2 values in modeled 8-hr maximum ozone estimates.

of considering multiple metrics to create a comprehensive understanding of model performance.

The range of reported model performance for ozone tended to be similar across many different subcategories including evaluations performed in the Eastern and Western U.S., modeling performed in forecast and retrospective modes, and modeling implemented with a variety of different chemical mechanisms or models. While this study is not designed to isolate causes for specific differences in model performance, it is worth noting that a specific chemical mechanism or modeling system did not show a pronounced improvement in ozone performance. Additional plots showing ozone performance split out by region (Eastern US vs Western US), spatial scale (local, regional, and superregional), and retrospective versus forecast modeling applications are provided in the Supplemental information.

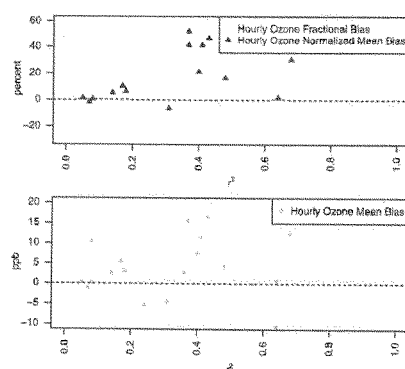


Fig. 7. Comparison of paired bias and r^2 values in modeled hourly ozone estimates.

3.2. Particulate matter

A total of 27 studies in this review reported model performance metrics for total $PM_{2.5}$ mass and 32 studies reported performance metrics for speciated $PM_{2.5}$. These studies compared modeled PM concentrations to measured values from the Chemical Speciation Network (CSN) (http://www.epa.gov/cgi-bin/htmxsql/mxplorer/query_spe.html), the Interagency Monitoring of Protected Visual Environments network (IMPROVE) (<http://views.cira.colostate.edu/web/>), the SouthEastern Aerosol Research and Characterization Study (SEARCH) network, and the Clean Air Status Trends Network (CASTNET). The CSN and IMPROVE networks provide 24-h average

speciated $PM_{2.5}$ and total mass measurements every 1, 3, or 6 days while CASTNET measures weekly average concentrations. The CSN sites are generally located in urban areas while IMPROVE and CASTNET sites tend to be located in national parks and rural areas.

Model performance metric distributions for $PM_{2.5}$ and speciated components of $PM_{2.5}$ are shown in Fig. 8 and Table S2. These illustrate how compensating errors in the contributions of chemical components to total mass complicates the interpretation of model performance for total fine PM mass. Although more studies report negative than positive bias for each $PM_{2.5}$ species and total mass, some studies compiled here do report positive bias (MB, FB, or NMB) for every $PM_{2.5}$ component. Because some species may be

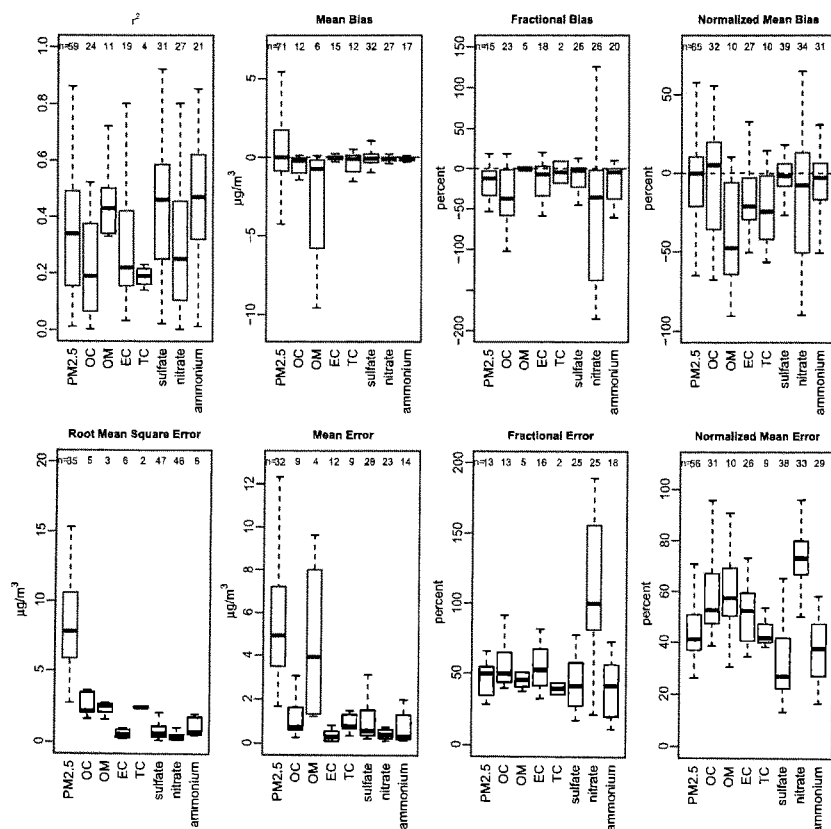


Fig. 8. Summary of PM performance metrics reported in the evaluated modeling studies. Centerlines show median values, boxes outline the 25th and 75th percentile values and whiskers extend to 1.5 times the interquartile range.

over-predicted while others are under-predicted, the evaluation of speciated $PM_{2.5}$ in addition to or in place of total mass provides more insight into emissions sources or atmospheric processes that are contributing to model performance.

Inter-comparison of model performance for speciated $PM_{2.5}$ is most challenging due to different pollutant classifications for carbonaceous aerosols and the “other” category. The “other” or “soil/crustal” category is sometimes defined using a linear combination of ions thought to be associated with crustal material with species-specific multipliers assuming the ions are fully oxidized. Alternatively, the “other” category is sometimes calculated as the difference between total measured $PM_{2.5}$ mass and the sum of the major speciated constituents. The “other” category in the model is generally made up of unspicated primary $PM_{2.5}$ since it is common practice to split primary PM into sulfate, nitrate, OC, EC, and “other”. Comparisons to ambient data for this second characterization is challenging to interpret since the type and magnitude of measurement artifacts are different for gravimetric techniques used to quantify total mass versus the chemical analyses used to characterize speciated components (Frank, 2006). Given the difficulty interpreting the “other” or “soil/crustal” category it is preferential to evaluate specific component species such as silicon or titanium when these species are treated explicitly in the simulation.

Carbonaceous aerosol is evaluated as organic mass (OM), organic carbon (OC), elemental carbon (EC), and/or total carbon (TC) (OC plus EC) in various articles. These disparate pollutant classifications limit our ability to intercompare studies. It is important to understand how each of these components is defined in both the model and measurements. Most monitoring networks report values of OC while many models estimate OM. To compare the model to measurements, an OM/OC ratio can be used either to convert measured carbon to total mass or modeled mass to carbon. When the former conversion is performed, it is common practice to use a single OM/OC ratio for all measurements (often 1.4 or 1.8) (Pun et al., 2006; Sakulyanontvittaya et al., 2008; Spak and Holloway, 2009; Stroud et al., 2011) even though many studies have shown that this ratio can vary substantially throughout the country (El-Zanan et al., 2005;

Frank, 2006; Malm and Hand, 2007; Simon et al., 2011; Turpin and Lim, 2001). However, the latter conversion can be done more accurately in models which track precursor-specific secondary organic aerosol (SOA) species and whether OM is aged or fresh. For example, the CMAQ model tracks 19 different SOA species each with a species-specific OM/OC ratio (Carlton et al., 2010).

The evaluation of carbonaceous aerosols is further complicated by the fact that OC and EC are operationally defined. There are two common measurement techniques to quantify ambient OC and EC: thermal optical reflectance (TOR) and thermal optical transmittance (TOT). OC values determined by these two techniques are similar in magnitude (Chow et al., 2001), but EC values determined by TOT have been reported to average about 60% less than EC values determined by TOR (Chow et al., 2001). Ideally, the method used to determine OC and EC emissions splits (and thus model splits for primary TC) would be the same method used to determine OC and EC concentrations in the ambient aerosol. Historically, the CSN used TOT to calculate OC/EC splits, but has recently switched (between 2007 and 2009) to TOR (IMPROVE has always used TOR). One option to provide consistency is to evaluate TC which is comparable between the two methods. However, this approach will mask valuable information about model performance related to physical processes and emissions sources. Evaluating OC and EC should be done with knowledge of the techniques being used to split OC and EC for ambient measurements and for the emissions inventory used in the model simulation.

Model performance for many PM species has some seasonally consistent features across the studies included in this analysis. The vast majority of studies evaluated PM species during summer months, but some report metrics for other seasons. Fig. 9 shows reported NMB values for $PM_{2.5}$, sulfate, nitrate, and OC split out by season. A common trend among all studies is that $PM_{2.5}$ is overestimated during the winter and underestimated during the summer. OC and nitrate overestimates contribute to the wintertime overestimate of $PM_{2.5}$ total mass. Appel et al. (2008) and Foley et al. (2010) also report that unspicated PM, mostly consisting of crustal material, can be substantially overestimated during the winter. Sulfate, nitrate, and OC are all reported as having negative bias

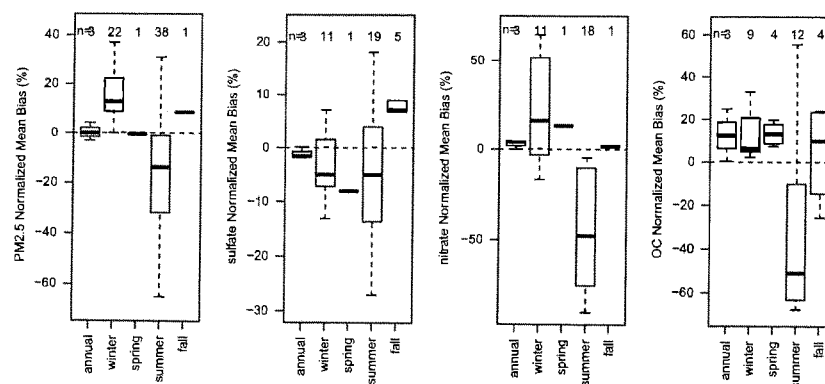


Fig. 9. PM NMB split out by season. Centerlines show median values, boxes outline the 25th and 75th percentile values and whiskers extend to 1.5 times the interquartile range.

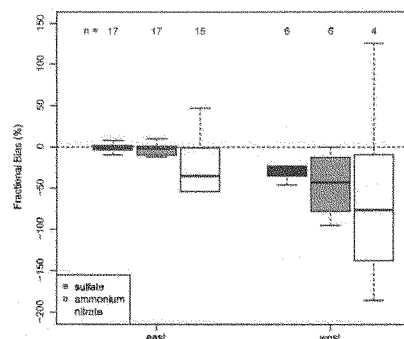


Fig. 10. PM FB in Eastern versus Western North America. Centerlines show median values, boxes outline the 25th and 75th percentile values and whiskers extend to 1.5 times the interquartile range.

during the summer. Since nitrate concentrations tend to be low in the summer, sulfate and OC contribute most of the summertime $PM_{2.5}$ underestimate reported in the literature. Model underestimates of SOA, which is a substantial component of OC during the summer (except during fire events), have been documented by a large number of studies (Carlton et al., 2010; de Gouw and Jimenez, 2009; Goldstein and Galbally, 2007; Simpson et al., 2007; Volkamer et al., 2006).

Model performance for $PM_{2.5}$ has been predominantly evaluated in the Eastern U.S. Fig. 10 shows a comparison of reported FB values for sulfate, nitrate, and ammonium in the East versus the West, with the Rocky Mountains as the dividing line. Other metrics and PM species are not shown due to lack of sufficient number of studies in the West. Reported model performance appears to be substantially better in the East versus the West. This result may be due to the predominant focus of model evaluations in the Eastern half of the US which presumably have been used to improve model inputs and processes in that region. In addition, measured and predicted sulfate concentrations are much lower in the West which may lead to higher relative biases. Also, high nitrate (and organic carbon) episodes which are related to meteorology that is specific to certain airsheds located in relatively complex terrain in the Western US may be difficult to fully capture in current models (Baker et al., 2011).

Additional plots showing speciated $PM_{2.5}$ performance for 6 metrics split out by grid resolution, region (Eastern US vs Western

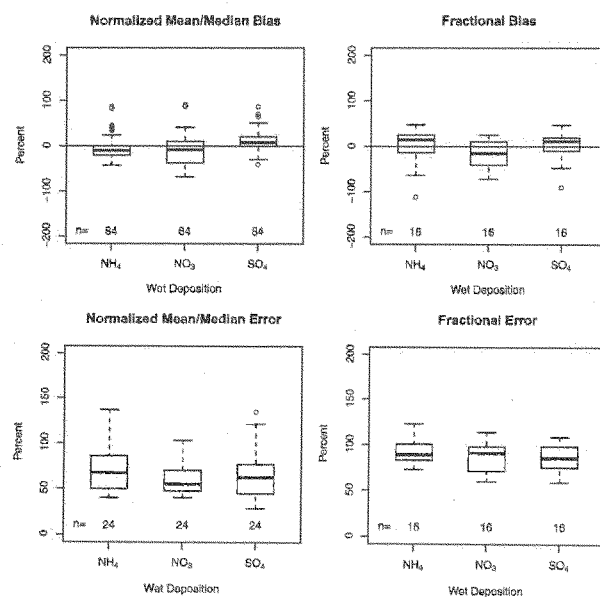


Fig. 11. Distribution of model performance metrics NMB, NME, FB, FE, NMdNB, and NMdNE for total wet deposition of sulfate, nitrate, and ammonium. Centerlines show median values, boxes outline the 25th and 75th percentile values and whiskers extend to 1.5 times the interquartile range.

US), spatial scale (local, regional, and superregional), and retrospective versus forecast modeling applications are provided in the Supplemental information.

3.3. Wet deposition: sulfate, nitrate, and ammonium

The evaluation of deposition is an important complement to the evaluation of ambient estimates. Since deposition is a direct function of ambient concentrations the evaluation of deposited species can help partially explain over or under-estimates of ambient species. Ideally, total deposition through dry and wet processes would be evaluated for all species but only wet deposition for certain species are routinely measured in the United States. Total wet deposition of sulfate, nitrate, and ammonium are measured as weekly totals at National Air Deposition Program (NADP) (<http://nadp.sws.uiuc.edu/NTM/>) monitor locations (Bigelow, 1991). These observations are paired with model estimates in 8 separate studies, 7 of which apply CMAQ and one CAMx. The version of CMAQ ranges from 4.3 to the more recent 4.7 (Table 1). Spatial scale ranges from a single State (North Carolina) at 4 km grid resolution to regional at 12 km grid resolution and continental at 36 km grid resolution. The number of metrics extracted from a study ranges from 12 to 180.

Reported metrics in these studies include FB, FE, NMB, NME, MdnB, MdnE, NMdnB, and NMdnE. The distribution of reported NMB, NME, FB, FE, NMB, and NME metrics are shown in Fig. 11. The quantiles of the distribution for each performance metric are shown in Table S3 for quantitative comparison. In the studies examined, sulfate wet deposition is slightly overestimated while nitrate wet deposition is slightly underestimated. Ammonium wet deposition appears to be slightly underestimated when examining normalized mean bias and normalized median bias but slightly overestimated using fractional bias. It is not clear that photochemical modeling systems generally demonstrate more skill in estimating total wet deposition of one pollutant compared to another.

The studies included in this analysis include performance metrics estimated on an annual basis and by season emphasizing summer and winter months. Fig. 12 shows NMB and NME by season for total wet deposition of sulfate, ammonium, and nitrate. Error is typically highest during the warmer months when increased rainfall is more frequent. Total sulfate wet deposition tends to be overestimated during most of the year while total nitrate wet deposition tends to be underestimated in the summer and overestimated in the winter. The outliers reflecting poorer performance on these figures are generally from applications with smaller grid resolution and domain size.

3.4. Wet deposition: mercury

Weekly total mercury wet deposition measurements are taken at sites that are part of the Mercury Deposition Network (<http://nadp.sws.uiuc.edu/MDN/>), which operate as part of the NADP (Vermette et al., 1995). Modeled estimates from 8 studies are compared to these observations and include 6 different photochemical models: CMAQ, TEAM, CAMx, REMSAD, CMAQ-MADRID, and CMAQ-AMSTERDAM. The spatial scales generally cover the continental United States or just the eastern United States with a horizontal grid resolution of 36 km. Grid resolutions less than or equal to 20 km are also included in this analysis but comprise less than half of the compiled metrics. Most of the studies are annual model simulations, approximately half of which are for the year 2001 or earlier (1995, 1996, and 1998). Few MDN sites were operational in the western U.S. before the early 2000s, meaning the

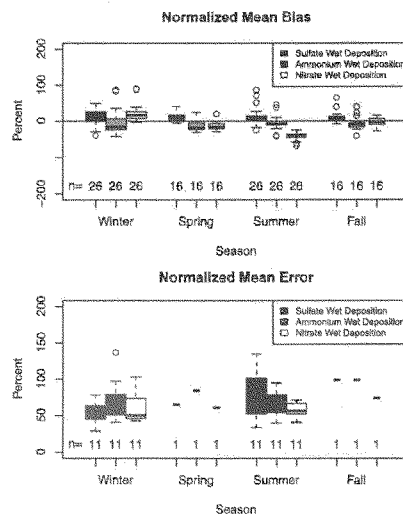


Fig. 12. Seasonal distribution of model performance metrics NMB and NME for total wet deposition of sulfate, nitrate, and ammonium. Lower and upper edges of the box represent the 25th and 75th percentiles.

performance presented in this analysis strongly focuses on the eastern United States.

The distribution of total mercury wet deposition NMB, NME, MB, ME, FE, and r^2 are shown in Fig. 13. The distribution quantiles for each performance metric are shown in Table S3 for quantitative comparison. Comparability between studies for reported performance metrics is challenging due to differences in averaging approaches. Some studies average all modeled and observed values at a particular monitor location then estimate performance metrics while others match observations and model estimates in space and time (weekly) then estimate performance metrics. Model performance for total mercury wet deposition is quite variable. Reported performance metrics indicate a general tendency of modeling systems to overestimate total mercury wet deposition. However, there is a clear need for more evaluation of total mercury wet deposition in the western United States using more recent modeling periods to take advantage of newer sites operating in that region. In addition, few studies evaluated mercury wet deposition at grid resolutions finer than 36 km. The outlier point for NMB in Fig. 13 represents a single simulation that was part of a larger study looking at performance of multiple mercury models with multiple meteorological input data (Bullock et al., 2009). The worst performing study for mean and fractional error is from the only 12 km application that estimated metrics specifically for the western United States (Baker and Bash, 2012). The outlier showing the best performance for normalized mean error reflects a modeling scenario that looks only at part of the eastern United States and that averaged the modeled and observed values before pairing to estimate the performance metric (Seigneur et al., 2006).

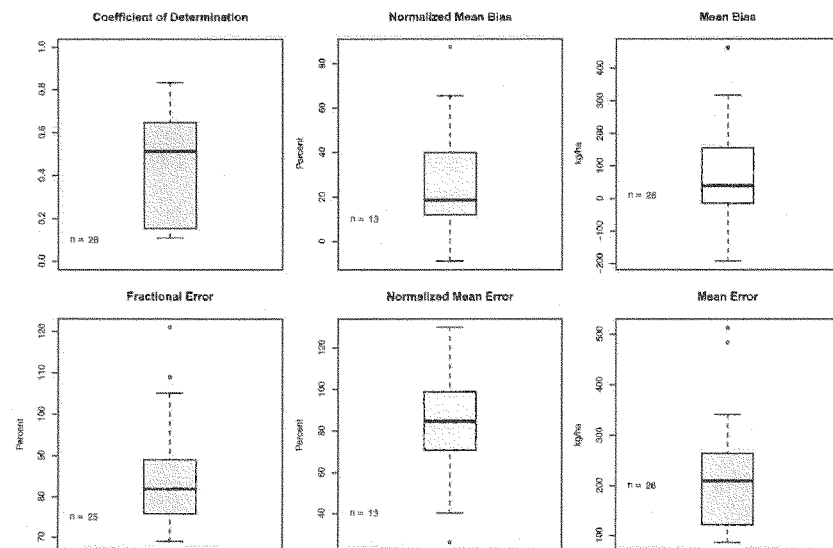


Fig. 13. Distribution of model performance metrics NMB, NME, MB, ME, FE, and r^2 for total mercury wet deposition. Lower and upper edges of the box represent the 25th and 75th percentiles.

4. Recommendations for regulatory model evaluations

Studies that present results intended to be relevant for regulatory modeling applications should at a minimum report mean observation, mean prediction, MB, ME (or RMSE), and a normalized bias and error (NMB/NME or FB/FE). In addition, the coefficient of determination provides useful information about the model's ability to capture observed variability. Reporting multiple performance metrics gives a more complete picture of the model's ability to capture magnitude of and variation in pollutant concentrations/deposition.

One problem associated with pairing the bias/error with the observed value is that data taken at low ambient concentrations can have very large percentages of bias/error. Consequently MNB and MNE values tend to be skewed by data points taken at very low concentrations and the bias tends to be skewed towards positive numbers. This metric can often result in counterintuitive results, for instance having a negative MB but a positive (and large) MNB. Given the propensity for misinterpretation and lack of symmetry around zero, the use of MNB and MNE metrics is not encouraged.

The literature review of operational model performance evaluations revealed large differences in the reporting of important details underlying estimation of aggregated metrics. Few of the studies explicitly state how observations and modeled estimates were paired in space and time before metrics were calculated. Many studies did not mention whether any spatial or temporal averaging was performed prior to the metric calculation. Evaluating data by pairing measurements with observations on the highest

temporal resolution available and for important regulatory averaging times (e.g. 8-h daily maximum ozone) will give the most meaningful results. It is important to report data processing steps for pairing model predictions and observation data in time and space and whether data are spatially/temporally averaged before or after statistics are calculated. The most appropriate approach is to match observed estimates with the modeled estimate from the grid cell where the monitor is located. For any evaluation it is important to not solely focus on grid cells with monitors but examine spatial plots of model estimates for reasonableness. Depending on the nature of the problem or pollutant you may want to consider if an important feature was captured by the model but was spatially displaced. At grid resolutions less than 12 km, it may be useful to use a bilinear interpolation of modeled values in the grid cells nearest the monitor to better characterize model skill.

Metrics should be calculated for subsets of pollutants that are most relevant for understanding the processes leading to high pollution episodes. For ozone, different processes tend to dominate the formation, destruction, and transport during times of high and low ambient concentrations. Consequently, model performance at higher observed concentrations (above 60 ppb) provides insight into how well the model replicates ozone pollution episodes. For $PM_{2.5}$, different chemical species generally have different sources and formation pathways. Therefore, it is especially important to evaluate each $PM_{2.5}$ component separately in order to understand whether the model is properly replicating the causes of high $PM_{2.5}$ episodes. For similar reasons it is desirable to evaluate model predictions subsetting by season and region, as different processes

may dominate pollution emissions and formation at different times and locations. Evaluations of performance over long time periods and large areas provide a robust characterization of overall performance but may fail to distinguish specific episodes for which the model either performs especially well or especially poorly. Depending on the nature and intent of the particular study, finer temporal and spatial aggregations may be appropriate if there are sufficient data to permit the calculation of meaningful statistics. For instance, metrics aggregated by day and monitor may be necessary to understand specific pollution events.

Although ozone and PM_{2.5} are the most commonly evaluated species in photochemical models, these models also output estimates of other criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂). Proper treatment of NO₂ and SO₂ in photochemical models is important since they are precursors to particulate matter (and ozone in the case of NO₂). In addition, CO is often evaluated as a tracer for vehicle emissions or other combustion sources and can help in the interpretation of model performance for other pollutants originating from these sources (de Gouw and Jimenez, 2009; Docherty et al., 2008; Slemr et al., 2002).¹ Only 14 of the 69 studies evaluated photochemical model performance for one or more of these species (CO, NO₂, or SO₂) (Fig. S-1). In addition to criteria pollutants, other ozone and PM precursors have been evaluated in a limited number of studies (Fig. S-2). Carlton and Baker (2011) evaluated formaldehyde and isoprene concentrations in the Ozark Mountains. Jin et al. (2010) report performance for non-methane hydrocarbons. Yu et al. (2006) report performance for peroxy acetyl nitrate (PAN), and seven studies report performance for various classifications of nitrogen species (NO, NO_x, and NO₂). More routine evaluation of ozone and PM_{2.5} precursors and chemical intermediates are desirable but may be limited by available measurements.

In addition to quantitative performance statistics that were the focus of this paper, other qualitative analyses may be useful for understanding model performance. Visualizing data through time series plots of modeled and observed ozone at one or more monitors and maps of mean bias/error statistics can help modelers identify times and locations of especially good or poor model performance. These analyses along with the statistics discussed at length may be used to improve model formulations or model inputs in order to achieve more accurate model simulations.

A range of model performance for ozone, PM_{2.5}, and wet deposition of various species are presented in this paper. This allows future model application projects to provide context for operational performance metrics. Future work should focus on metrics that are robust when aggregated, including mean bias, mean error, normalized mean bias, normalized mean error, fractional bias, and fractional error and include a description of how observations and predictions are paired in time and space before averaging. Ozone performance should be presented in bins of observed ozone to provide insight into the different physical and chemical processes that may influence ozone formation. When elevated levels of ozone are the focus, a minimum threshold of 60 ppb may be applied to remove prediction–observation pairs that are less relevant to the level of the ozone NAAQS. Finally, it is necessary to understand measurement artifacts and measurement uncertainty in order to make a meaningful interpretation of comparisons of modeled data.

¹ It is noteworthy that point measurements of CO (which can have steep gradients near sources) may not be commensurate with model predictions that are averaged over the area of a grid cell.

Disclaimer

Although this work was reviewed by EPA and approved for publication, it may not necessarily reflect official Agency policy.

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Appendix A. Supplementary information

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.atmosenv.2012.07.012>.

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APPENDIX D

541

**Harrington Generating Station
Units 1, 2 & 3**

**Tolk Generating Station
Units 1 & 2**

**Phase 1 AQCS Engineering Services Project
Study**

prepared for



Amarillo, TX

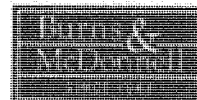
November 2011

Project No. 62866

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

DRAFT REV B



The major replacements include changing the bags and cages for options that include fabric filters and changing the catalyst for options that include an SCR. Capital costs include new bags that will be supplied with the new fabric filter. It is estimated that all of the bags will need to be replaced every three years for a fabric filter. Also, capital costs include the first two out of three layers of catalyst for the SCR. It is estimated that a single layer of SCR catalyst will need to be replaced every 3 years.

The capital costs include a 5 year landfill cell. The ongoing capital costs include closing the previous cell and building a new 5 year cell. The ongoing capital costs are shown in Table 8.8. Further ongoing capital cost detail can be found in Appendix J.

CONFIGURATION	PLANT	FABRIC FILTER	SCR Catalyst	FUTURE LANDFILL	AVERAGE YEARLY ONGOING CAPITAL (\$MIL/YR)
		Estimated Bag Replacement Cost (\$MIL/3 Years)	Single Layer Replacement Cost (\$MIL/3 Years)	Estimated Cost Including Closure (\$MIL/5 Years)	
1B-5/1B-41A	Harrington	--	\$2.0	\$4.3	\$1.5
	Tolk	--	\$5.7	\$5.6	\$3.0
	Total	--	\$7.7	\$9.9	\$4.5
1B-5/1B-42	Harrington	\$3.1	\$2.0	\$2.7	\$2.2
	Tolk	\$4.4	\$5.7	\$4.0	\$4.2
	Total	\$7.6	\$7.7	\$6.7	\$6.4
1B-5/1B-42A	Harrington	--	\$2.0	\$4.1	\$1.5
	Tolk	--	\$5.7	\$6.0	\$3.1
	Total	--	\$7.7	\$10.1	\$4.6
1B-5/1B-43	Harrington	\$6.1	\$2.0	\$0.8	\$2.8
	Tolk	\$8.9	\$5.7	\$1.1	\$5.1
	Total	\$15.0	\$7.7	\$1.9	\$7.9
1B-5/1B-43A	Harrington	\$2.9	\$2.0	\$2.2	\$2.1
	Tolk	--	\$5.7	\$5.2	\$2.9
	Total	\$2.9	\$7.7	\$7.4	\$5.0
1B-5/1B-45	Harrington	--	\$2.0	\$6.4	\$1.9
	Tolk	--	\$5.7	\$6.5	\$3.2
	Total	--	\$7.7	\$12.9	\$5.1
1B-5/1B-46	Harrington	\$6.1	\$2.0	\$2.9	\$3.3
	Tolk	--	\$5.7	\$5.8	\$3.1
	Total	\$6.1	\$7.7	\$8.7	\$6.3
1B-5/1B-46A	Harrington	\$2.9	\$2.0	\$4.3	\$2.5
	Tolk	--	\$5.7	\$5.8	\$3.1
	Total	\$2.9	\$7.7	\$10.1	\$5.6
2B-5/2B-21	Harrington	--	\$2.0	\$3.2	\$1.3
	Tolk	--	\$5.7	\$5.8	\$3.1
	Total	--	\$7.7	\$9.0	\$4.4
2B-5/2B-23	Harrington	--	\$2.0	\$1.0	\$0.8
	Tolk	--	\$5.7	\$1.3	\$2.2
	Total	--	\$7.7	\$2.3	\$3.0
2B-5/2B-25	Harrington	\$7.3	\$2.0	\$3.1	\$3.7
	Tolk	--	\$5.7	\$5.8	\$3.1
	Total	\$7.3	\$7.7	\$8.9	\$6.8
2B-5/2B-27	Harrington	\$7.3	\$2.0	\$0.9	\$3.3
	Tolk	\$10.7	\$5.7	\$1.2	\$5.7
	Total	\$17.9	\$7.7	\$2.1	\$9.0
2B-5/2B-29	Harrington	\$6.1	\$2.0	\$3.0	\$3.3
	Tolk	--	\$5.7	\$5.8	\$3.1
	Total	\$6.1	\$7.7	\$8.7	\$6.3
2B-5/2B-31	Harrington	\$6.1	\$2.0	\$0.8	\$2.8
	Tolk	\$8.9	\$5.7	\$1.1	\$5.1
	Total	\$15.0	\$7.7	\$1.9	\$7.9
2B-5/2B-31A	Harrington	\$6.1	\$2.0	\$0.8	\$2.8
	Tolk	--	\$5.7	\$5.2	\$2.9
	Total	\$6.1	\$7.7	\$6.0	\$5.8

APPENDIX E

Sources Undergoing Reasonable Progress and Long-Term Strategy Analyses in Texas

Facility	Units	Controls to be Added ¹	Percent of Extinction for the Avg. Impacts on Worst 20% (W20%) Days at the Most Impacted Area ² (%)	Most Impacted Class I Area ³	Control Scenario Evaluations			
					Estimated Decline in Improvement in the Most Impacted Area ⁴ (2018 background) (del-6)	Estimated Decline in Improvement in the Most Impacted Area ⁴ (Avg. Natural Conditions) (del-6)	Average Change in Extinction on Worst 20% (W20%) Days at the Most Impacted Area ⁵ (Min-1)	Cost Effectiveness ⁶ (\$/ton)
Big Brown	1	WFGD	1.03	WIMO	0.088	0.436	0.741	1,255
	2	WFGD	1.03	WIMO	0.088	0.438	0.743	1,257
Sandow 4	1	Scrubber Upgrade	0.974	WIMO	0.062	0.312	0.526	—
	2	WFGD	0.981	WIMO	0.051	0.254	0.428	1,937
Monticello	1	WFGD	0.877	WIMO	0.047	0.233	0.393	2,170
	2	WFGD	0.877	WIMO	0.047	0.233	0.393	—
Martin Lake	1	Scrubber Upgrade	0.659	WIMO	0.040	0.185	0.310	—
	2	Scrubber Upgrade	0.572	WIMO	0.040	0.185	0.310	—
Colinto Creek	1	WFGD	0.513	WIMO	0.040	0.200	0.336	2,278
	2	WFGD	0.383	WIMO	0.027	0.135	0.226	—
Limestone	1	Scrubber Upgrade	0.414	WIMO	0.030	0.149	0.249	—
	2	Scrubber Upgrade	0.414	WIMO	0.030	0.149	0.249	—
San Miguel	1	—	0.333	BIBE	—	—	—	—
	2	—	0.333	BIBE	—	—	—	—
Tolk	1	SDA	0.312	GLIMO	0.022	0.087	0.123	3,178
	2	SDA	0.308	GLIMO	0.024	0.095	0.134	2,998
Welsh	1	—	0.274	WIMO	0.022	0.100	0.182	3,508
	2	—	0.287	WIMO	0.022	0.111	0.186	3,454
W. A. Parish ⁷	3	—	0.301	WIMO	0.023	0.116	0.194	3,379
	5	—	0.053	WIMO	0.023	0.117	0.195	2,389
W. A. Parish	6	—	0.289	WIMO	0.022	0.117	0.194	2,389
	7	—	0.298	WIMO	0.023	0.117	0.194	2,389
W. A. Parish	8	—	0.240	WIMO	0.023	0.117	0.194	2,389
	8	—	0.240	WIMO	0.023	0.117	0.194	2,389

1. EPA's proposed controls based on their four factor analysis (WFGD = Wet Flue Gas Desulfurization; SDA = Spray Dryer Absorber).

2. EPA used a value of 0.3% to exclude sources from further analysis. Values obtained from Table A4.4 of the FIP TSD (estimated unit impact adjusted to reflect 2008-2012 average emissions).

3. WIMO = Wichita Mountains; BIBE = Big Bend; GLIMO = Guadalupe Mountains.

4. Values correspond to the Most Impacted Area as obtained from Table A6.4 of the FIP TSD.

5. Average change in extinction based on recent actual emissions (2009-2013) obtained from Tables A.6-1a and c of the FIP TSD.

6. Cost effectiveness for WFGD shown for all units in this table with the exception of the Tolk units since wet scrubbers are not being considered at Tolk due to lack of water supply.

7. There appears to be an error in Table A4.4 of the FIP TSD document in the numbering for the W.A. Parish units. The table should include units 5-8, but instead lists information for 6-9. For reference purposes of all W.A. Parish units evaluated in the FIP TSD, we have included the Percent Extinction for "Unit 5" within the row for "Unit 5". This assumes that EPA has documented the information for units 6 and 7 correctly and has not mixed up the information.

All information obtained from 2014-11XX FIP TSD.pdf

WRITTEN TESTIMONY OF BECKY KEOGH, DIRECTOR
ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY

BEFORE
THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
OVERSIGHT HEARING ON:

“COOPERATIVE FEDERALISM: STATE PERSPECTIVES ON EPA
REGULATORY ACTIONS AND
THE ROLE OF STATES AS CO-REGULATORS”

MARCH 9, 2016

Chairman Inhofe, Ranking Member Boxer, and Members of the Committee, good morning, my name is Becky Keogh. I am the Director of the Arkansas Department of Environmental Quality, also known as ADEQ. I bring you greetings from Governor Hutchinson of Arkansas, and I appreciated the opportunity to respond to your call from the several states for a local perspective on our relationship and level of cooperation with the United States Environmental Protection Agency.

We in Arkansas are seeking to drive regulatory policy and programs that balance effective environmental results of clean air and water, assure long-term resource management, affordable energy, and economic -growth goals that are important to our citizens, businesses, and the communities in which they seek licenses to operate. We want a state that can attract the newest generation of professionals

who seek communities that offer healthy living and the world-class recreational options that we enjoy in Arkansas. Arkansas is invested heavily in assuring that we are wise stewards of the abundant and clean water, healthy breathing air, and the amazing vistas with which we have been blessed. We do not take our name of “The Natural State” lightly. We strive to fairly and consistently serve the corresponding and complimentary roles of environmental stewardship and economic development.

Likewise, for decades, we successfully worked with the EPA under a symbiotic governing model that is the topic of today’s hearing—cooperative federalism. This notion is born of something uniquely American, our system of federalism whereby the nation and states function together as co-sovereigns. Until the last several years, when it came to federal regulation, whether it be the Clean Air Act or the Clean Water Act, we would propose and the EPA would dispose. Both the EPA and the states had a relatively balanced seat at the table. And, as we are known to do in the South, we would all sit around the table and have a good-old fashioned meal. There would be lively debate, ample servings, and both us and the EPA would cooperatively prepare the meal. However, this once treasured family-style dining with our federal partners is a thing of the past. Now, we have an

increasingly diminished role in the menu selection or meal preparation. We are forced to eat what is served.

The cooperative-federalism model that has defined Arkansas's relation with the EPA beginning in the 1970s has morphed in something that can be better described as coercive federalism. We have seen a decrease in time and tolerance for State Implementation Programs (SIPs) and a dramatic increase in EPA takeovers, or Federal Implementation Programs (FIPs). Historically FIPs were used as the weapon of last resort for our EPA partner, its nuclear option for states that were unfaithful to the partnership or denied the marriage outright. However, under the prevailing paradigm, FIPs are used as an everyday tool (often of dubious origin) in the EPA's vast arsenal. To give perspective on this shift, it is worth noting that in the past seven years the states have been forced to digest more of these federal hostile takeovers, known as FIPs, than were served in the prior three federal administrations combined, ten times over.

Cooperative federalism regimes rest on governmental cooperation. States will not waste the time to draft their own proposals if they expect the federal government to do what it wants in the end anyway. That is to no one's benefit: A portion of State sovereignty is lost, while our unique and individual state constituencies lose out on

the benefits of local regulatory innovation. Cooperative federalism regimes should be designed to foster cooperation, not discourage it. Congress should aim to remedy this problem through amendment to the current controlling legislation, and should consider the importance of fostering cooperation when it designs new cooperative federalism regimes.

Currently, states are placed in the unfair position of having purchased a very expensive seat at the table—having learned the hard (and expensive) way; if you want local control, it will cost you—but then finding out that all meals are served exclusively from the EPA’s table, and we are to be served a fixed menu, without a fixed price. The notion of *table d’hôte* without *prix fixe*, is distinctly un-American. States shoulder almost ninety percent of the cost of implementation of federal environmental regulation. However, until recent years, we were glad to pick up the tab because the cost to the states was mitigated by the healthy respect and accompanying deference we received from our federal regulatory partner. And, if there was ever a question of the relative standing of our partnership, one could solve the tie by simply pointing to the findings statement contained in the Clean Air Act at 42 USC §7401 (a)(3):

The Congress finds . . . that air pollution prevention (that is the reduction or elimination, through any measures, of the amount of pollutants produced or created

at the source) and air pollution control at its source *is the primary responsibility of States and local governments.*

We ask for your assistance in resetting the needle to the point of its origin, whether this task be accomplished by way of Congressional clarification or judicial charge or the two working in tandem. In our estimation, Congress calls for the meal to be served, the states host the occasion, and the EPA be a frequent guest at each state's table. If the party does not occur is goes beyond what Congress has ordered, the judicial branch steps in to sort out the guest list and menu.

However, where we are now can best be described as a progressive dinner party gone bad. We are told that in its current form the Clean Air Act affords the EPA no discretion to give states that have acted in good faith a window within which to comply with a newly announced federal standard (despite the fact that the original finding that the states were out of compliance is more than two-years old). This makes little sense. While it seems logical to give the federal government the leeway not to provide a window for state compliance with a new standard where the federal government adjudges that a state has not acted in good faith, it nevertheless seems that the federal government should have the leeway to provide such a window where a state has acted in good faith and realistically could not

guess what standard the federal government would in the end promulgate. Cooperative federalism should reward cooperative behavior, not punish it.

States have recognized an unprecedented level of federal actions. To borrow a saying in the South, “we have more on our plate than we can say Grace over”. The sheer number of mandates and deadlines, further complicated by the complexity of rules being finalized, leaves us in a position where we are being served our appetizer, soup, salad, main course, and dessert, all at the same time. And, if we do not clean every crumb from our plates, we are banished from the table. States rarely have sufficient notice and implementation of rules from EPA to accomplish meaningful outcomes before moving to the next one. And, while we are left unable to get a taste of one course before another arrives, the EPA allows its work to buildup—picking and choosing which items are most savory or will look best on its menu. The EPA is afforded the luxury of being the ultimate picky eater, while we states are struggling to digest these five-course meals, plus last-night’s leftovers.

For example, in the ozone regulations that the EPA recently finalized, states were just beginning to realize the outcomes and benefits of implementation of the recent federal rules (for the 2008 standard), yet another new standard was already being proposed and finalized prior to initiating action again (whether it was necessary or

not). Specifically for Arkansas, we are finalizing SIPs for implementation of new short-term standards, while at the same time new ozone standards are being finalized and (with little notice) a second phase of Cross State Air Pollution standards were proposed that are inconsistent with our existing SIP. As such, we have at best overlapping and at worse conflicting directives, and regardless of which scenario plays out we have wasted resources. At the same time, failure or delay of federal approvals of SIP rules for water-quality and air-quality programs have created more regulatory uncertainty for the states and those regulated. To solve this, Arkansas is now seeking ways to work with the EPA on how we can consolidate or supersede previously submitted rules without facing legal conflicts.

The reality that states are now more pawn than partner is nowhere better evidenced than in the EPA's transformation of a two-sentence legislative passage into a two-thousand page rule with profound consequences and extraordinary costs. In the Clean Power Plan, Arkansas and other states that were already realizing reductions of carbon emissions across the grid were sent on a "race" to find answers to complex and critical analysis that we have referred to as a set of doors. Despite one door being labeled mass and the other being labeled rate, we were unable to predict whether the other side (of either door) provided safety and security of our energy and environment. A majority of states came together and have successfully

petitioned the highest court of the land to take a pause as lower courts hear the arguments of the states that the EPA has gone far beyond the authority granted to it and in fact the establishment of a carbon-reduction target (or any environmental standard for that matter). It is Arkansas's position that the EPA should not be permitted to proceed by simply ignoring Congress or the Constitution. Serving up cooperative federalism in a coercive manner is distasteful, but for the executive branch to ignore that the chairs at our metaphorical table are stabilized by three legs and not just one, makes for a difficult and messy meal.

While we want a seat at the table, as a co-sovereign (that is picking up much of the tab at the end of these expensive meals), we should not be force-fed the EPA's regulation de jour in an un-American fashion. Ironically, the great majority of FIPs that we states have been bombarded with result from the EPA's recent re-interpretation of its "Good Neighbor" provisions. As states, we try and be good neighbors; but when we are told to comply with targets that are either undisclosed or constantly in flux; and the targets may or may not correspond with any measurable environmental impact; and the mandates come at a great cost to the tax and rate payers, we are ready for new neighbors or a new neighborhood.

For example, in relation to the Clean Water Act, we are left to navigate federal interpretation of Arkansas's water-quality criteria. This system of water-quality protection was designed to establish natural water-quality conditions for extremely pure water streams under a robust monitoring protection. However, under recent federal interpretation, these once state-developed, extraordinarily heightened criteria have now become unrealistic and often un-achievable minimum water-protection standards. The EPA executed the ultimate bait and switch.

In conclusion, not only has the uniquely American cooperative-federalism model fallen to a more totalitarian, coercive-federalism scheme, and the state role is now less partner and more pawn, we also see "sue and settle" appearing on the EPA's menu more and more frequently. As we states are more often asked to navigate the increasingly litigious "green" lobby fighting hand-in-hand with the EPA, we states are left to wonder if this vocal special interest currently occupies the seat at the table that was once reserved for us. If this proves to be true and our pleas for relief are not heard and acted upon by Congress or the courts, as we say in the South, "bless our hearts." When the states are disenfranchised, so is the truth of our federalist democracy, and the people the WE represent.

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 MERITAS LAW FIRMS WORLDWIDE

April 20, 2015

*Via Federal Express,
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Mr. Guy Donaldson
Chief Air Planning Section (6PD-L)
Environmental Protection Agency
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

RE: Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility, EPA Docket No. EPA-R06-OAR-2014-0754

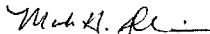
Dear Mr. Donaldson:

This firm represents Nucor Steel – Arkansas, a division of Nucor Corporation and Nucor-Yamato Steel Company. Enclosed are Nucor Steel – Arkansas, Nucor Steel – Jewett, Texas and Nucor-Yamato Steel Company's comments on EPA's Proposed Rule in the above-referenced Docket Number.

Please let me know if you have any questions.

Sincerely,

DOVER DIXON HORNE PLLC


Mark H. Allison

MHA/njp
Enclosure

cc: Wayne Turney
Les Jackson

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RE: Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility, EPA Docket No. EPA-R06-OAR-2014-0754

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Please let me know if you have any questions.

Sincerely,

DOVER DIXON HORNE PLLC

Mark H. Allison
Mark H. Allison

MHA/njp
Enclosure

cc: Wayne Turney
Les Jackson

Comments of Nucor Steel – Arkansas, a division of Nucor Corporation, Nucor Steel-Jewett, Texas a division of Nucor Corporation, and Nucor-Yamato Steel Company on Texas/Oklahoma Regional Haze Rule

EPA Docket No. EPA-R06-OAR-2014-754

Submitted April 20, 2015

Nucor Steel – Arkansas, a division of Nucor Corporation, Nucor Steel – Jewett, Texas, a division of Nucor Corporation, and Nucor-Yamato Steel Company (collectively “Nucor”) submit the following comments on EPA’s Proposed Rule – Approval and Promulgation of Implementation Plans; Texas and Oklahoma; Regional Haze State Implementation Plans; Interstate Transport State Implementation Plan to Address Pollution Affecting Visibility and Regional Haze; Federal Implementation Plan for Regional Haze and Interstate Transport of Pollution Affecting Visibility, EPA Docket No. EPA-R06-OAR-2014-0754, published in the Federal Register on December 16, 2014, 79 F.R. 74818. Nucor submits these comments because EPA’s proposed rule is based on a new interpretation of the Regional Haze Rule and the visibility provisions of the Clean Air Act, and because EPA has stated that it intends this interpretation to apply to all states. 79 F.R. 74829, 74888.

Nucor disagrees with EPA’s interpretation and determination that the Regional Haze Rule and the Clean Air Act allow EPA to disapprove the Texas SIP and to therefore issue a Federal Implementation Plan on the basis that the Texas SIP does not include “measures to prohibit emissions that would interfere with the reasonable progress goals set to protect Class I areas in other states.” 79 F.R. 74820. The visibility protection requirement in §110(a)(2)(D)(i)(II) of the Clean Air Act does not require a SIP to contain provisions that

prohibit emissions that will interfere with visibility “reasonable progress goals” of other states; it requires adequate provisions prohibiting emissions that will interfere with “measures” required to be included in the applicable implementation plan for any other state.” The SIP requirements for visibility are different from the language in §110(a)(2)(D)(i)(I) for protection of the NAAQS, which requires adequate SIP provisions to prohibit emissions that contribute to nonattainment of or that interfere with another state’s maintenance of a national ambient air quality standard. The visibility protection requirement in §110(a)(2)(D)(i)(II) is narrower and requires only provisions necessary to prevent interference with control measures included in another state’s plan to achieve a visibility standard. Reasonable progress goals, projected deciview improvements and the like are standards; they are not “measures”, i.e. they are not actions taken or enforced by a state to achieve a standard or goal. EPA’s interpretation ignores and improperly eliminates the differences in the language Congress used for NAAQS SIP requirements, and the language used for visibility SIP requirements. To the extent that EPA’s disapproval of the Texas and Oklahoma SIPS is premised on the language in §110(a)(2)(D)(i)(II), but is not based on direct interference with a specific control measure in another state’s regional haze SIP (as opposed to interference with a regional haze related goal in or underlying another state’s SIP), EPA’s interpretation is contrary to the clear and express language of section 110 of the Clean Air Act.

In addition, EPA’s interpretation is contrary to the Clean Air Act’s clear direction that each State is to determine its own emission limits, schedules of compliance and other measures for sources in that state for purposes of visibility protection under §169A. EPA’s interpretation would effectively give one state the power to control another state’s regional haze SIP decisions, including its BART determinations. Moreover, in this case, EPA improperly overrides the SIP decisions by both states involved, Texas and Oklahoma.

EPA's interpretation also is contrary to the CAA because it improperly focuses on case by case, source specific analyses of individual sources located in Texas to achieve Oklahoma's reasonable progress goals which would require more stringent analysis and controls than authorized under the Clean Air Act. See, WildEarth Guardians v. EPA, 770 F.3d 919. (10th Cir. 2014). EPA' proposed rule and FIP also is improperly based on a "visibility benefit" factor in determining reasonable progress, a factor that is not one of the four factors authorized under the Clean Air Act. See, 42 U.S.C. 7491(g)(1); 40 CFR §51.308(d)(1)(i)(A). Finally, EPA's interpretation and rule is contrary to the CAA because it seeks to establish reductions that it deems necessary to meet reasonable progress goals beyond the 2018 planning period addressed by the states of Texas and Oklahoma in their SIPs.

Nucor Steel – Arkansas, a division of Nucor Corporation

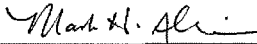
Nucor Steel – Jewett, Texas, a division of Nucor Corporation

And

Nucor-Yamato Steel Company

By Their Attorneys

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By: 
Mark H. Allison

DOCUMENTS SUBMITTED BY REPRESENTATIVE SUZANNE BONAMICI



March 22, 2016

The Honorable Jim Bridenstine
Chairman
House Committee on Science, Space, and Technology
Subcommittee on Environment
2321 Rayburn House Office Building
Washington, DC 20515

The Honorable Suzanne Bonamici
Ranking Member
Subcommittee on Environment
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Bridenstine and Ranking Member Bonamici

Since 1919, the National Parks Conservation Association (NPCA) has been the leading voice of the American people in protecting and enhancing our National Park System. NPCA advocates for protection of the natural environment, including air quality, in and around national parks. On behalf of our more than one million members and supporters nationwide, NPCA submits this letter to the committee in regards to the March 23, 2016 hearing titled, "Examining EPA's Regional Haze Program: Regulations Without Visible Benefits."

For 100 years, the United States has honored a legal and moral obligation to protect America's National Parks striving to leave them unimpaired for future generations. In what has been lauded as "America's best idea," Congress first set aside national parks and wilderness areas in the nineteenth century to preserve some of the nation's most spectacular scenery and wildlife habitat.¹ Today, many of these iconic areas are marred by air pollution. Much of the air pollution in national parks stems from sources including power plants, agriculture, vehicles, and the oil and gas industry. These and other sources emit pollutants including sulfur dioxide, nitrogen oxides and particulate matter, which react in the atmosphere to form "haze" pollution that can extend many miles downwind of the source.

I. Addressing Impaired National Park and Wilderness Air Quality through the Clean Air Act Visibility Protection Mandate

¹ John Copeland Nagle, *The Scenic Protections of the Clean Air Act*, 88 N.D. L. Rev. 571, 576 (2011).

Nearly four decades ago, a bipartisan group of lawmakers recognized the impact air pollution was having on iconic national parks, wilderness areas, and the local economies that depend upon them. “Certain areas of the United States are dependent upon their intrinsic beauty and historical and archeological treasures as a means of promoting their economic viability.” H.R. Rep. No. 95-294, at 203-07 (1977).

Air pollution is among the most significant threats to public lands, disrupting ecosystems and scenic views alike. To reduce the harm from air pollution at Class I areas – 156 of the country’s largest and most iconic national parks and wilderness areas – Congress set a national goal of restoring natural air quality to these places by preventing all visibility impairment caused by human activities. As a result, regulations developed by the U.S. Environmental Protection Agency (EPA) aim to achieve the objective, originally set in 1977, by 2064.

To achieve Congress’s national goal, Section 169 of the Clean Air Act requires each state to develop an implementation plan to reduce, and ultimately eliminate, air pollution from sources within its borders that causes or contributes to visibility impairment in any Class I area. While the Congress of 1977 instructed EPA to develop visibility improving regulations, it was more than 20 years until such regulations were finally adopted, and a decade more before EPA began to implement them in earnest. Fortunately, over the past five years, states and EPA have advanced some important pollutant reduction plans benefiting the air quality at public lands.

Over the years, implementation of various Clean Air Act programs, including the National Ambient Air Quality Standards, the Transport Rule and the Regional Haze Rule, has resulted in important air quality improvements. Continued enforcement of these plans will result in cleaner air at Class I areas and the many communities that share their air. Yet, not a single Class I designated area has achieved the statutorily mandated natural air quality goal. Today, on average, a national park visitor misses out on 50 miles of scenery due to haze pollution, a distance equivalent to the length of Rhode Island.

Where emission reductions have been required, park visitors experience a visible difference in scenic views, but the job is not done. For instance, at Great Smoky Mountains National Park, in the 1990s the average visibility at the park was 25 miles. In the last decade, reduced pollution in the surrounding area—most notably from closing or retrofitting Tennessee Valley Authority power plants—improved air quality considerably. As a result, visitors can now see 46 miles away on average. While this is a significant change, it is still less than half of natural visibility conditions. Without pollution, vistas would stretch out for roughly 112 miles through the rolling southern Appalachian Mountains. This reality demonstrates the persistence of the problem and need for measures to continue to achieve reasonable progress towards the national natural visibility objective.

II. Visibility and Public Health Benefits of Reduced Park Pollution

Gains through implementation of the Regional Haze Rule extend from benefits to Class I area visitors to tourism based local economies to public health. Emission reductions required through state regional haze plans will produce critical visibility results as they are implemented. For example, the combination of control requirements and unit shutdowns at Four Corners power plant will result in vast visibility improvements at Mesa Verde National Park and at least seventeen other national parks and wildernesses in the region. Controls on Hayden Unit 1 in Colorado will result in clearer skies at Rocky Mountain National Park and other parks in the southwest. The installation of scrubbers at Sooner Units 1 and 2 in Oklahoma will improve visibility at Class I areas including Wichita Mountains. These are but few of the examples that

demonstrate the successful impact the Regional Haze Rule is or will have on Class I areas across the country.

The same pollutants that contribute to visibility impairment also harm public health. Nitrogen oxides are precursors to ground level ozone, which is associated with respiratory diseases, asthma attacks, and decreased lung function. Similarly, sulfur dioxide increases asthma symptoms, and can form particulates that aggravate respiratory and heart diseases and cause premature death. Both nitrogen oxides and sulfur dioxide react with ammonia, moisture, and other compounds to form fine particulate matter that can cause and worsen respiratory diseases, aggravate heart disease, and lead to premature death. Particulate matter can penetrate deep into the lungs and cause a host of health problems, such as aggravated asthma, chronic bronchitis, and heart attacks.

In 2005, EPA found that under its medium emission reduction scenario, the Regional Haze Rule would result in approximately \$240 million in improved visibility benefits each year. EPA also projected that in 2015, the Regional Haze Rule will provide nationwide health benefits valued at \$8.4 – \$9.8 billion annually—preventing 1,600 premature deaths, 2,200 non-fatal heart attacks, 960 hospital admissions, and over 1 million lost school and work days every year.

More recent analysis shows that the benefits EPA projected in 2005 were underestimated. For example, in a health study of the recently finalized Texas/Oklahoma regional haze plan alone, Dr. George Thurston, Professor of Environmental Medicine at the New York University School of Medicine and expert on the evaluation of the human health effects of air pollution, estimates that EPA's required sulfur dioxide pollution reductions for the 15 coal-fired power plants in Texas will save at least 316 lives *each year*, and prevent thousands of asthma-related or cardiovascular events and hospitalizations every year. This study conservatively estimates that the total public health-based economic benefits associated with these reductions will be at least \$3 billion each year. These are *annual* benefits, meaning that "ten years from the compliance date, the health benefits and valuations of the [] controls will be roughly ten times" that estimate, before adjustment for a discount rate, as appropriate."

III. The Economic Importance of National Parks and Value of Clean, Clear Air

In 2014, the National Park Service reported a record 293 million National Park visitors. Those visitors spent \$15.7 billion in gateway communities around each park, generating \$29.7 billion benefit to the U.S. economy and supporting 277,000 jobs nationwide. In turn, this tourism sustains over 22,000 national park employees.

In a 2012 a Hart Research Associates and North Star Opinion Research poll found that 95 percent of voters want the federal government to ensure national parks are protected for the future. Parks marred by haze pollution lack such protection. The National Park Service research referenced below shows that parks obscured by haze pollution will not draw the same numbers of visitor stays.

A 1983 National Park Service study demonstrated that visitors are able to perceive different degrees of visibility. In the same report, visitors to Grand Canyon and Mesa Verde national parks who said the park was hazy also reported enjoying the park less. "Clean, clear air" is consistently one of the top four features visitors at every park mention as a reason for their trip. Any amount of visible pollution undermines the experience.

Many Americans say they would be willing to pay more for clean air. Maryland-based non-partisan Abt Associates, Inc. (“Abt”) quantified just how much in their 2000 report, “Out of Sight: The Science and Economics of Visibility Impairment.” Using a contingent valuation study, which measures how much visitors say they would pay for something, Abt researchers found many Americans would pay “substantial sums for improved visibility” at the national parks.

That commitment extends beyond nearby parks. The National Parks Visibility Values Study in 1990 found that park visitors want to protect park air, even if they do not live anywhere near the park in question. California respondents to one poll said they would pay on average \$73.93 more a year in park entrance fees for specific pollution controls at parks in their region. Those surveyed stated that they would pay another \$50.56 on average for improved air quality at parks outside their region.

At the same time, park gateway communities would benefit financially from improved park air quality. If visibility improvements increased a single park’s visitation by 25 percent, Abt researchers said, the annual benefit to a park and its local community ranged from \$13 million and 390 new jobs at Indiana Dunes National Lakeshore to \$320 million and 4,188 new jobs at Great Smoky Mountains. In the spirit of the centennial anniversary of the National Park Service, we hope that today’s members of Congress will work in unison to advance the important national park air quality

objectives, much as they did in 1977. National Park. Park concessionaires nationwide also would benefit, with a \$160 million sales boost nationwide.

Many park visitors, however, say they will change their travel plans if the park they plan to visit is hazy. The 1983 National Park Service survey found that if visibility at a vista in either Grand Canyon or Mesa Verde National park diminished from “average” to “poor,” 61 percent of visitors said they would spend less time at the viewpoint and 80 percent said they would spend less time overall in the park. Most said they would cut their trip by 13 hours—the average park visit is 14 hours.

Most recently, a comprehensive 2013 NPS report, “National Park Service Visitor Values & Perceptions of Clean Air, Scenic Views & Dark Night Skies” looked across 64 studied surveys conducted between 1988-2011 in 49 National Park System units regarding the importance of 19 national park resources ranging from native plants to dark skies and cultural sites to clean air. The surveys collected responses from a total of 30,319 individuals and found that 88 percent of park visitors found clean air to be extremely important or very important, ranking clean air as one of the five most important attributes meriting protection.

In a separate study focusing on the connection between visibility and visitors at Great Smoky Mountains National Park, Poudyal et al. in “Estimating the impact of impaired visibility on the demand for visits to national parks” finds that just a 5 percent increase in visibility range (2.75 km) would result in an approximate increase of half a million annual visits. An improvement of 15 percent could result in approximately one and half million increased visitors.

IV. Conclusion


There is no question, Americans value their national parks and recognize how important clean air is to visitors and National Park Service employees’ health as well as wildlife, water and plant resources. Steady reduction in haze-causing pollution is precisely what is required under the

Regional Haze Rule to safeguard our iconic landscapes, support local communities, and protect the health of all.

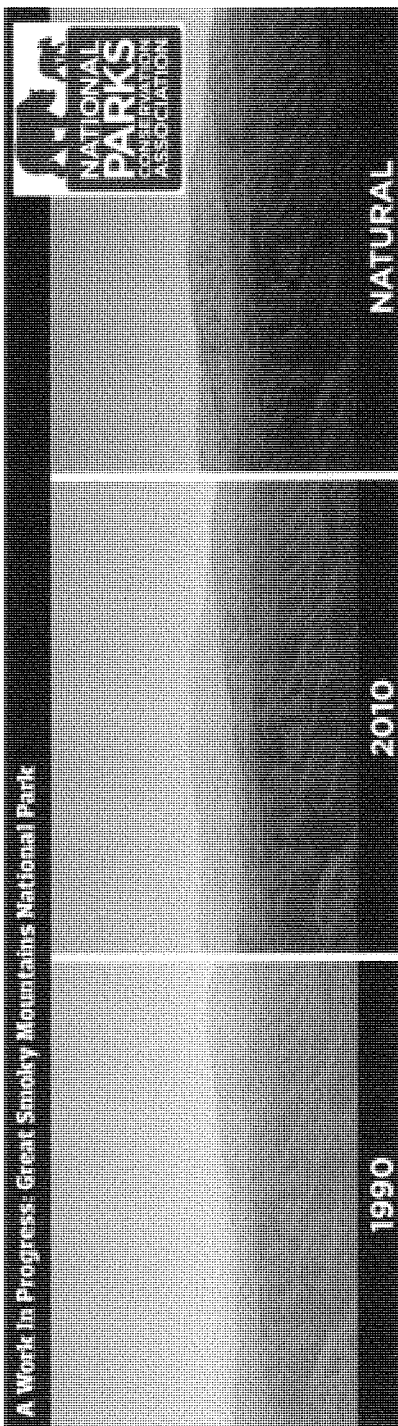
In the spirit of the centennial anniversary of the National Park Service, we hope that today's members of Congress will work in unison to advance the important national park air quality objectives, much as they did in 1977. Our national parks and wildernesses, and the millions of people that value them deserve a clean air future.

Thank you for your consideration of these comments. Please contact me at skodish@npca.org or 865.329.2424 if you have any questions or concerns.

Sincerely,

A handwritten signature in black ink, appearing to read 'SKODISH', with a stylized, flowing script.

Stephanie Kodish
Senior Director and Counsel, Clean Air Program
National Parks Conservation Association





Now in its fourth year, the Sustainable Energy in America Factbook series documents the revolution transforming how the US produces, delivers, and consumes energy. The 2016 Factbook provides an update through the end of 2015, highlighting a number of key developments that occurred as the long-term transformation of US energy continues to unfold.

Two thousand fifteen will surely be remembered as a watershed year in the evolution of US energy, as the industry passed important milestones and the federal government finalized critical new policies. The already rapid de-carbonization of the US power sector accelerated with record numbers of coal plant closures and solar photovoltaic system commissionings, while natural gas production and consumption hit an all-time high. Concurrently, the US continued to enjoy greater benefits from energy efficiency efforts as economic growth outpaced the growth in electricity consumption.

The net result on the planet: US power sector CO₂ emissions fell to their lowest annual level since the mid-1990s. The net impact on consumers: negligible to positive as prices for electricity and fuel remained low by historic standards and customer choices expanded. Perhaps most importantly, many of the key changes seen in 2015 are likely permanent shifts, rather than temporary adjustments due to one-time events.

On the policy front, major initiatives appear poised to keep the US on track toward de-carbonization in the coming decades. In August, the Obama administration finalized its Clean Power Plan regulation for the existing US power fleet. In December, the US joined with 194 other nations in France to adopt the "Paris Agreement" which includes pledges to rein in emissions over the coming decades. The year closed with Congressional approval of a major, five-year extension of key tax credits supporting new US wind and solar projects and a two-year extension of measures supporting energy efficiency. The Production Tax Credit (PTC) was also extended to cover geothermal, biomass, waste-to-energy, landfill gas, hydro and ocean energy projects that commence construction before 2017.

The Sustainable Energy in America Factbook provides a detailed look at the state of US energy and the role that a range of new technologies are playing in reshaping the industry. The Factbook is researched and produced by Bloomberg New Energy Finance and commissioned by the Business Council for Sustainable Energy. As always, the goal is to offer simple, accurate benchmarks on the status and contributions of new sustainable energy technologies.

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What is it and what's new

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What is it?

- Aims to augment existing, reputable sources of information on US energy
- Focuses on **renewables, efficiency, natural gas**
- **Fills important data gaps** in certain areas (eg, investment flows by sector, contribution of distributed energy)
- Contains data through the end of 2015 wherever possible
- Employs **Bloomberg New Energy Finance data** in most cases, augmented by EIA, FERC, ACEEE, ICF International, LBNL, and other sources where necessary
- Contains the very **latest information on new energy technology costs**
- Has been graciously underwritten by the **Business Council for Sustainable Energy**
- Is in its **fourth edition** (first published in January 2013)

What's new?

- **Format:** This year's edition of the Factbook (this document) consists of Powerpoint slides showing updated charts. For those looking for more context on any sector, the 2014 edition⁽¹⁾ can continue to serve as a reference. The emphasis of this 2016 edition is to *capture new developments that occurred in the past year*.
- **Updated analysis:** Most charts have been extended by one year to capture the latest data.
- **2015 developments:** The text in the slides highlights major changes that occurred over the past year.
- **New coverage:** This report contains data shown for the first time in the Factbook, including analyses of US leveled costs of electricity, corporate renewables procurement, US transmission build, small-scale CHP generation and additional energy efficiency data.

(1) The 2014 Factbook can be found here: <http://www.bcase.org/factbook/pdfs/2014%20Sustainable%20Energy%20in%20America%20Factbook.pdf>

Understanding terminology for this report

SUSTAINABLE ENERGY (as defined in this report)	FOSSIL-FIRED / NUCLEAR POWER	RENEWABLE ENERGY	DISTRIBUTED POWER, STORAGE, EFFICIENCY	TRANSPORT
	<ul style="list-style-type: none"> • Natural gas • CCS 	<ul style="list-style-type: none"> • Solar • Wind • Geothermal • Hydro • Biomass • Biogas • Waste-to-energy 	<ul style="list-style-type: none"> • Small-scale renewables • CHP and WHP • Fuel cells • Storage • Smart grid / demand response • Building efficiency • Industrial efficiency (aluminum) • Direct use applications for natural gas 	<ul style="list-style-type: none"> • Electric vehicles (including hybrids) • Natural gas vehicles
OTHER CLEAN ENERGY (not covered in this report)	<ul style="list-style-type: none"> • Nuclear 	<ul style="list-style-type: none"> • Wave / tidal 	<ul style="list-style-type: none"> • Lighting • Industrial efficiency (other industries) 	<ul style="list-style-type: none"> • Biofuels



About this Factbook (4 of 4)
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The Business Council for **Sustainable Energy®**

The Business Council for Sustainable Energy (BCSE) is a coalition of companies and trade associations from the energy efficiency, natural gas and renewable energy sectors. The Council membership also includes independent electric power producers, investor-owned utilities, public power, commercial end-users and project developers and service providers for energy and environmental markets. Since 1992, the Council has been a leading industry voice advocating for policies at the state, national and international levels that increase the use of commercially-available clean energy technologies, products and services.

2015 was a transformative year in the US energy industry. Greater energy efficiency and structural changes to the composition of the economy allowed the US to achieve higher energy productivity. The power sector continued to de-carbonize and add near-record amounts of clean energy as policy activity at the global, national and state levels set the country on track for further emissions abatement. Unprecedented levels of natural gas supply pushed down power prices, putting the country in a more internationally competitive position while also prompting coal-to-gas switching that slashed US carbon emissions. Utilities are investing more in energy efficiency measures to curb both electricity and gas demand. At the same time, the grid itself is being reshaped by greater penetration of renewables and growth in distributed resources such as solar PV and storage. The policy frameworks laid out in 2015, combined with the beginnings of structural change in the power sector and beyond, are pushing the country toward greater energy productivity and cleaner growth in the decades to come.

As in years past, the goal of the 2016 Factbook is relatively simple: to record and highlight the important developments that transpired in US energy over the prior 12 months. It also provides a look back over the past seven years, and in some cases decades, to show trends. Among the most notable developments:

Investment in energy efficiency continues to pay dividends for the US economy.

- Energy productivity – the ratio of US GDP to energy consumed – continues to grow, improving by 2.3% from 2014 to 2015 following a 1.1% increase the previous year. The US economy has now grown by 10% since 2007, while primary energy consumption has fallen by 2.4%. And while the shifting composition of the US economy is no doubt a driver, estimates put forward by the American Council for an Energy Efficient Economy indicate that as much as 60% of the energy intensity improvements seen since 1980 are due to efficiency gains, with only 40% the result of structural changes in the US economy.
- Within the electricity sector specifically, this “decoupling” – a disconnection between energy consumption and economic growth – is also visible: electric load growth in 2015 clocked in at only 0.5%, compared to a projected 2.4% increase in GDP. And since 2007, electricity demand has been flat, compared to a compounded annual growth rate of 2.4% from 1990 to 2000.
- Meanwhile, final data for 2014 – the latest year for which we have estimates – show that annual investment in energy efficiency measures continues to grow. Natural gas and electric utility spending on efficiency reached \$6.7bn, up 8.1% from the \$6.2bn seen in 2013; Energy Savings Performance Contracting (ESPC) investment topped \$6.4bn. Accordingly, electricity savings continue to climb year-on-year, breaching 25GWh in 2015. Since 2007, incremental efficiency achievements have risen 17% on average annually. On a sectoral basis, efficiency investment shrank slightly in the residential sector for the first time in over a decade, but expanded in commercial, industrial and other sectors. Regionally, New England, the Pacific, Great Lakes and the Mid-Atlantic region still lead in electrical efficiency savings. The Southeast remains a largely untapped market with fewer enabling policies such as energy efficiency resource standards (EERS).

The US is making major strides toward a de-carbonized electricity grid and set important new records in 2015. Critically, these milestones represent structural changes to the fleet, suggesting a permanent change is afoot.

- Challenging economics and the shadow of environmental regulations encouraged the accelerated retirement 14GW of coal-fired power plants, while representing 5% of the installed coal capacity in the country. Since 2005, the US has disconnected over 40GW of coal-burning power plants, while adding only 19GW new coal to the grid. Several gigawatts of coal-fired capacity have also converted to natural gas or, in a few cases, biomass. Due to both these retirements and competition from low-priced natural gas, coal provided only 34% of US electricity generation in 2015, down from 39% in 2014 and from 50% at its peak in 2005.
- Renewables continue to pick up steam, with an estimated 8.5GW of wind and 7.3GW of solar photovoltaic (PV) installed in 2015. Wind build was 65% above 2014 levels, as developers rushed to complete construction ahead of the anticipated end-2016 expiration date of the Production Tax Credit. In total, 2015's tally of 16.4GW fell just shy of 2012's record 18.2GW of new renewable capacity; however, PV additions across both the distributed and utility-scale sectors set new records as 2.9GW and 4.4GW, respectively, connected to the grid. This represents a 13% bump up from 2014 build for PV. New hydro build hit 306MW (+115% from 2014) and geothermal added 61MW of new capacity (+33%). Biomass, biogas and waste-to-energy together added 224MW, up 15% from the year before.
- As natural gas prices sank to their lowest levels since 1999 and natural gas plants displaced generation previously provided by retiring coal plants, natural gas consumption in the power sector exceeded 10quads for the first time ever, surpassing 2012's high-water mark of 9.8quads. Natural gas is now within striking distance of being the largest source of US power, producing just over 32% of US generation in 2015, compared to 34% for coal.
- Importantly, surging renewables build and coal retirements have not triggered a dramatic leap in retail power prices. Average retail electricity rates across the country remain 5.8% below the recent peak (2008) in real terms, in part due to cheap generation from natural gas. Year on year, retail rates in 2015 fell 1.3% in real terms, even as real GDP grew by 2.4%. There are, however, regional price differences. New York, Texas, the Southeast and states in the central southern US reaped the greatest price reductions over the past year (over 2%) and generally have the lowest retail prices in the country. California saw the largest uptick (1.8%) and, alongside New York and New England, has some of the highest retail prices in the contiguous US.
- The continued low cost of power allows the US to potentially out-compete a number of other countries on electricity charges for businesses, with average industrial retail rates in the US (7.1¢/kWh in 2014) far below those of Germany (15.9¢/kWh), China (14.3¢/kWh) and even India (10.7¢/kWh).
- Corporate procurement of clean energy continues to grow, doubling from 2013 to 2014 and again from 2014 to 2015. In 2015 alone, corporations contracted 3.1GW of new renewable capacity. Although wind farms make up the majority of this contracted capacity, solar jumped from 0.3GW in 2014 to 1.1GW the following year, quadrupling its share of the overall pie. Large corporate buyers included Google, Amazon, Facebook and Apple; the list of key players covered the retail, technology, manufacturing, financial and insurance sectors. Additionally, corporations such as IKEA, Comcast, Hyatt, Morgan Stanley, and Johnson & Johnson announced and/or commissioned fuel cell capacity in 2015.

The evolution of US power is rapidly reducing the country's overall carbon footprint.

- The changes that have taken place over the past decade through 2015 resulted in the lowest yearly carbon emissions produced by the US power sector since 1995. At 1985Mt, the 2015 emissions figure was 4.3% below 2014 levels and 17.8% below 2005 levels. Two thousand five is both the benchmark against which the Clean Power Plan is measured, and against which the Obama administration set the goal of 26-28% emission reduction by 2025 contained in the US' Intended Nationally Determined Contribution (INDC) for the UN climate talks in Paris.

Critical policy supports have been unveiled that, if fully implemented, will ensure the US remains on track to a lower-carbon energy sector.

- The Obama administration sought to give policy certainty to the power industry and accelerate the de-carbonization of the US grid by finalizing regulations limiting carbon emissions from power plants in August 2015. The Clean Power Plan, which will regulate the country's existing fleet of fossil-fired power plants, aims to cut emissions 32% (relative to 2005 levels) by 2030 through assigning each state a target emissions level (in tons of carbon) or emissions rate (in tons per megawatt hour). As the centerpiece of the Obama Administration's INDC, the Plan was also supported by the New Source Performance Standards (NSPS) which set limits on emissions from newly constructed plants and will effectively require new coal-fired power plants to install carbon capture and storage technology.
- The Clean Power Plan's reduction burdens (as measured by required cuts to emissions levels) vary widely across states. Those on the West Coast and in New England face smaller reduction targets that they are already on track to meet, while more coal-reliant states like Montana, the Dakotas and Kansas must cut emission levels by over 30%, even after accounting for recent and planned abatement actions such as coal retirements. To achieve these targets, states must design and carry out their own implementation programs, which will likely require a combination of coal-to-gas switching, renewables build and demand reduction measures such as energy efficiency. State proposals are due to the EPA by September 2018 and will be implemented from 2022 to 2030.
- In mid-December, 195 countries came together to sign the "Paris Agreement." The Agreement is effectively a hedgepodge of bottom-up pledges from individual countries, including the US pledge to bring emissions to 26-28% below 2005 levels by 2025. Paris marks only one small milestone on the path to halting global climate change: as they stand today, the pledges would be insufficient for hitting the "below 2°C" goal. But the agreement's framework also includes five-year "check-ins" at which countries are encouraged to re-submit and strengthen their commitments.

Executive summary (4 of 8)

Continued: Critical policy supports have been unveiled that, if fully implemented, will ensure the US remains on track to a lower-carbon energy sector.

- On December 18, Congress passed comprehensive spending and tax packages which revived critical federal supports for segments of the renewable energy and energy efficiency industries, while also lifting a 40-year-long ban on crude oil exports. The bill extended tax credits for wind and solar by five years apiece, through 2019 and 2021, respectively. Federal tax incentives for both technologies will be stepped down over the five-year periods. The Production Tax Credit for other renewable technologies (including biomass, geothermal, waste-to-energy and hydroelectricity) was only given an additional two years, through end-2016. The Investment Tax Credit for fuel cells was unchanged and will expire at the end of 2016. Energy efficiency incentives for residential, industrial and commercial investments were prolonged through December 31, 2016. Efforts are already underway to ensure these other clean energy technologies see their credits expanded further in 2016.
- Just after the close of the year, on January 25, 2016, the US Supreme Court issued a key ruling that would effectively allow "demand response" (DR) programs to continue among large end-users. The Court upheld the Federal Energy Regulatory Committee's authority to regulate DR within the wholesale energy markets. The decision brings several years of uncertainty to an end for DR players and should allow the market to flourish more broadly. Currently DR, which incentivizes industrial users to cut their consumption at times of excessively high demand, is most popular within the PJM Interconnection, a wholesale electricity market covering a number of mid-Atlantic and Northeastern states.
- In much of the country, state policy is as important as federal in advancing clean energy and the underlying infrastructure necessary to support it. For example, state and local "net energy metering" (NEM) policies and utility rate designs are essential to the economics of distributed generation. Two thousand fifteen saw two significant and differing regulatory proposals for addressing NEM. California unveiled a second-generation "NEM 2.0" program which maintains a net metering regime, with requirements that solar customers move to time-of-use rates, pay an upfront interconnection fee and pay the same non-bypassable charges as customers without a solar system. Neighboring Nevada adopted NEM program changes that alter the rates charged and credits granted to customers with rooftop solar, changing the economics for both existing and future solar customers. Similar proceedings regarding NEM and rate design policies are underway elsewhere, as states consider the implications of further growth in distributed generation and how to balance the need to advance deployment, while addressing concerns over potential rate inequities between solar-owning and non-solar-owning ratepayers, which could affect future investments in the underlying grid infrastructure.
- Another form of critical state policy is the renewable portfolio standard (RPS) – a state mandate on the share of utility-delivered power provided by clean energy. RPS are the main driver behind wind and solar build in the Northeast; they incentivize renewables generation in other states as well. In 2015, Hawaii increased its target to 100% renewables by 2045, while California and New York raised their targets to 50% by 2030. Meanwhile, West Virginia became the first state to repeal its RPS and Kansas turned its mandatory standard into a voluntary program.

Continued: Critical policy supports have been unveiled that, if fully implemented, will ensure the US remains on track to a lower-carbon energy sector.

- Energy efficiency resource standards (EERS) have advanced in the past decade, but momentum slowed after 2010. Florida and Indiana removed their programs in 2014, Ohio froze its scheme in 2015 and federal support of energy efficiency did not receive the five-year extension that was granted to wind and solar investments. However, a handful of states including Delaware, Utah and New Hampshire are on their way toward adopting EERS. Additionally, the final Clean Power Plan has an option for states to count energy efficiency measures toward compliance.
- Nevertheless, state and local governments continue to enact other critical policies to promote energy savings, with 10 states adopting more stringent residential and commercial building codes in 2015, including Texas, California and New Jersey. Three cities, including Atlanta, enhanced building energy use policies, setting mandates for commercial buildings to report and benchmark their consumption. As of the end of 2015, 6.5bn square feet of commercial floor space, or around 7.7% of total US commercial sector floor space, was covered by such policies.

A 'new normal' of lower oil prices is being felt through the US economy and offers both opportunities and potential obstacles to the greening of US energy.

- Lower gasoline prices dented sales of alternatively-fueled vehicles in 2015. Hybrid and plug-in hybrid vehicles, which compete more directly with traditional gasoline-fueled cars, took the biggest hit: sales of these two vehicle classes were down 16% and 24%, respectively, relative to 2014. But other equally important factors were also at play, including supply constraints and delays in new model rollouts that dampened sales in the first half of 2015.
- However, sales of battery electric vehicles (BEV) proved resilient, growing 16% over the course of 2015, relative to 2014 levels. State and federal purchasing credits help to keep the lifetime costs of BEV ownership up to 25% below that of comparable midsize gasoline-fueled cars. Additionally, a significant amount of BEV purchases – notably, those of the Tesla Model S – continue to be motivated by non-economic factors.
- Overall, gasoline consumption rose 4.1% in 2015, the largest annual increase since 1988, as prices at the pump fell an additional 11% after collapsing by one third in 2014. For the first time since record-keeping began in 2008, the average fuel economy of vehicles sold for model year 2015 stayed flat relative to the previous year, at 25.3mpg. In previous years, the impact of Americans' preference for SUVs and pick-up trucks had been tempered by both higher oil prices and improving vehicle efficiency, in line with federal Corporate Average Fuel Economy (CAFE) standards. Over the past year and a half, however, the collapse of retail gasoline prices by more than 40% was enough to stall the annual gains in vehicle efficiency. But 2015 may prove to be an anomaly: the average fuel economy of vehicles sold remains 20% above that of 2008 levels, and continued hikes in CAFE requirements should ensure a return to this trend over the long term.

Executive summary (6 of 8)

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Continued: A 'new normal' of lower oil prices is being felt through the US economy and offers both opportunities and potential obstacles to the greening of US energy.

- Natural gas production and storage inventories reached all-time highs in 2015. Sustained low energy prices have prompted oil and gas producers to decrease drilling activity; hence, fewer rigs are in operation, leading to more competition amongst rig operators. Service companies have slashed fees in response, allowing drilling and completion costs to fall for oil and natural gas wells alike. In addition, improved technology and experience have enabled producers to continue to produce natural gas at even lower costs, with many of them focusing on regions with the most favorable production economics. Together, these factors have buoyed supplies in a depressed price environment. In December 2015, natural gas prices fell to the lowest levels seen since 1999.
- Thus, although lower-priced crude has little direct effect on the power sector (oil is burned for less than 2% of US generation), it has indirectly impacted the electricity markets by helping to weigh down natural gas prices. Natural gas-burning power plants substantially influence power prices across the US. As gas prices have fallen, so have wholesale power prices. For power generators bidding into the wholesale electricity markets, the decrease in power prices has squeezed profit margins. The lower-priced gas environment changes the equation for all power generators operating in deregulated markets, by potentially lowering future revenue streams.
- For technologies such as solar thermal and solar PV, falling power prices can make "grid parity" that much more difficult to achieve. However, generation costs associated with renewables have also been dropping. In windy parts of the country like Texas and the Midwest, wind developers have signed long-term power purchase agreements (PPAs) in the range of \$19-35/MWh, undercutting both on-peak and off-peak power prices as well as other sources of generation. Also in Texas, utility-scale solar plants have achieved PPAs at rates close to \$50/MWh, and in regions with either high retail electricity rates or high solar PV capacity factors, distributed solar can be an economically competitive option for homeowners. These falling costs, combined with the anticipated drawdown on the federal Investment Tax Credit and the expiration of the Production Tax Credit, led to significant build in solar and wind in 2015. New build in solar (7.3GW) and wind (8.5GW) outpaced even that of natural gas (6.0GW). Wind in particular marked a 65% increase in build from the previous year. Geothermal, hydro, biomass, biogas and waste-to-energy saw 0.6GW of build. New capacity additions in 2015 for geothermal jumped one-third from the previous year, while biomass, biogas and waste-to-energy saw a 15% bump. The rate of hydro installations soared 115% during the same period.

Executive summary (7 of 8)

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The US continues to extract unprecedented volumes of natural gas thanks to greater productivity from existing resources. This extraordinary resource is being put to use in a growing variety of ways.

- Low gas prices are further supported by Appalachian Basin shale production, which continues to expand despite a shrinking rig count as producers drill more selectively and technologies improve. Output from the Marcellus and Utica shales has been so abundant that domestic natural gas production through the first nine months of 2015 increased 6.8% from 2014 and 26% from 2007 levels, even as traditional "dry" gas production has declined.
- With the natural gas center of supply rapidly shifting from the Gulf Coast to the Northeast, midstream companies are playing catch-up to reverse existing pipelines and to re-plumb the network to transport gas out of the inundated Appalachian Basin. In 2015, companies installed over 11Bcfd of total pipeline capacity across the country, including 3.3Bcfd of takeaway capacity from the Marcellus and Utica shales. Many more projects were approved or filed for approval this year, but due to routine delays, the bulk of these projects are not expected to be in service until 2017 or 2018.
- Gas utility construction expenditures for distribution infrastructure rose to \$9.7 billion in 2014, compared to an average of about \$5 billion per year during the 2000s, according to data compiled by the American Gas Association. This reflects, in part, the increased prevalence of natural gas replacement and expansion programs across the US.

Investment in zero-carbon energy and enabling technologies maintained its momentum.

- Since 2007, the US has poured \$445bn into renewable energy and energy smart technologies, which enable the integration of variable sources of power generation into the grid. Annual totals range from \$36bn to \$64bn; investment in 2015 hit \$56bn, up 8% from the year before. Just over half of all new investment was directed towards solar, and 21% towards wind. The increase came as project developers rushed to get projects online ahead of the anticipated expiration of critical federal tax credits, and as falling costs made rooftop solar economically competitive in parts of the country.
- Asset financing, which includes only investment in new projects, for biomass facilities rebounded to \$349m in 2015 from none the previous year; biogas received \$285m in 2015, about seven times what it saw in 2014. The rush was again due to tax credit considerations. At the same time, flows into other renewables continue to taper, with virtually no new financing directed towards new construction in geothermal, small hydro or carbon capture and storage in 2015. Waste-to-energy has not seen asset financing since 2012. Outside of the power sector, energy smart technologies attracted \$3.1bn, with Tesla Motors leading the pack.
- Investment in key infrastructure to support the transformation of the grid remains critical and continues to lag the rapid build-out of renewable technologies in some regions of the country. Transmission constraints in high wind-build areas such as the Midwest, for example, have led to the curtailment of generation from zero-carbon sources. In 2014, investor-owned utilities invested \$98bn in upgrading the electric grid; early estimates put forward by the Edison Electric Institute suggest \$20bn was directed towards transmission. In Texas, a multi-year \$7bn investment in the Competitive Renewable Energy Zone (CREZ) has allowed the state to connect up to 18GW of wind capacity in the West and the Panhandle to load centers in the Southeast, helping to relieve transmission congestion costs and reduce curtailment. Several large projects, currently in the planning stage, hope to follow Texas' lead by building new lines connecting wind in Kansas and Iowa to demand in the Midwest and Mid-Atlantic.

Continued: Investment in zero-carbon energy and enabling technologies maintained its momentum.

- Globally, the US held its place as the second-most attractive country for clean energy investment – but it remains far behind China, which received \$111bn worth of capital flows into the sector compared to the US \$56bn. Other APAC countries brought in \$58bn, while investment in Europe fell off dramatically to \$59bn from \$72bn in 2014.

Renewable energy technologies represent a substantial and growing portion of the overall US power matrix.

- Renewables including large hydro now make up 20% of the US plant stack, at 222GW. Hydroelectric facilities and pumped storage represent nearly half of this at 102GW – a figure that has stayed roughly constant since 2008. Wind is the second-most prevalent renewable technology, standing at almost 75GW at the end of 2015, roughly triple its installed capacity at the end of 2008 (25GW). But solar has been the fastest growing, averaging a 60% clip annually since 2008 to bring its total capacity to 28GW.
- Geothermal, biomass, biogas, and waste-to-energy additions have grown at a slower pace, with 3.2GW added collectively since 2008. Capacity for biomass, biogas and waste-to-energy reached a total of 13.5GW in 2015, 15% above 2008. Geothermal installations have also risen 15% since 2008, to finish 2015 at 3.6GW. These technologies provide around-the-clock power at leveled costs comparable to those of other renewables, but they have not enjoyed the same policy support as the wind and solar industries. They continue to represent roughly 17GW of capacity across the country. Hydropower, for its part, is also supported differently compared to wind and solar, which has meant that installed capacity has stagnated at just under 102GW since 2008.
- Distributed generation, driven by solar PV, is playing a rapidly growing role in the renewable energy story. 2015 was yet another record year for distributed solar PV in the US, with 2.9GW of new build due to growth in both the commercial and residential sectors. As a result, cumulative distributed PV capacity in the US now exceeds 11GW. Build for combined heat and power (CHP) installations ticked up 25% over 2013 levels, clocking in at 847MW in 2014, due to greater demand from the industrial sector. Cheaper gas has also incentivized CHP generation, which soared from 304TWh in 2013 to over 360TWh in 2014 and 2015. However, not all news is good for distributed generation outside of solar. Growth in CHP is still hampered by the lack of supportive federal or state policies. Activity in other distributed, smaller scale technologies has also been muted, with only 6MW of small- and medium-scale wind built in 2014 and three small-scale biogas projects in 2015.
- Behind-the-meter storage has grown in popularity among commercial and industrial players in states such as California, Hawaii and New York, where utilities set high demand charges. Some of the storage projects are supported by subsidies such as the Self-Generation Incentive Program (SGIP) in California, which offers \$1.46/W for a storage system and has induced the installation of 119 projects, or 2.4MW of commercial storage in the state. The economics for residential distributed storage have been less favorable as net metering and lack of time-of-use tariffs limit its economic case. However, utilities such as Southern California Edison, Con Edison, and the Hawaiian Electric Company have begun to explore aggregated distributed storage (sometimes with solar). Companies including Sunverge, Stem, Green Charge Networks and Advanced Microgrid Systems have started piloting advanced storage management systems to coordinate and aggregate distributed storage (sometimes also coupled with solar or other generation sources). In 2015, aggregated storage bid successfully into California's real-time power market; the technology can also provide grid services.

The remainder of this document can be found here: <http://about.bnel.com/content/uploads/sites/4/2016/02/BLSE-2016-Sustainable-Energy-in-America-Factbook.pdf>